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ONTARIO GEOLOGICAL SURVEY

Open File Report 6050

Report of Activities, 2000
Resident Geologist Program

Timmins Regional Resident Geologist Report:
Timmins and Sault Ste. Marie Districts

by

B.T. Atkinson, M. Hailstone, G. Wm. Seim, A.C. Wilson, D.M. Draper, D. Farrow, P. Hope, R. Debicki and G. Yule

2001

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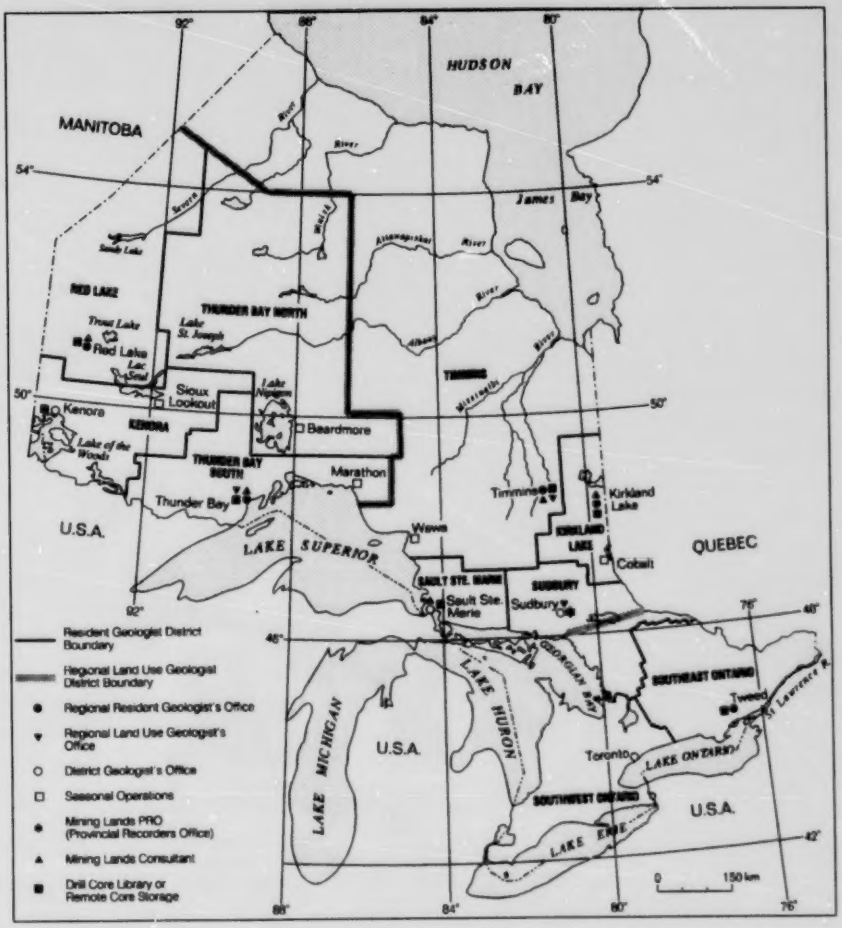

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ONTARIO GEOLOGICAL SURVEY

RESIDENT GEOLOGIST PROGRAM

REPORT OF ACTIVITIES – 2000

TIMMINS REGIONAL RESIDENT GEOLOGIST REPORT

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2. Sault Ste. Marie District
3. Regional Land Use Geologist – Northeast

Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Timmins Regional Resident Geologist (Timmins District) - 2000

by

B. T. Atkinson, G. Wm. Seim, A. C. Wilson, D. M. Draper and P. Hope

2001

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TIMMINS REGIONAL RESIDENT GEOLOGIST DISTRICT -- 2000

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INTRODUCTION

With the new millennium came a change in exploration focus throughout the district with increasing attention being directed towards diamonds in the Wawa to Kapuskasing area and James Bay lowlands as well as platinum group element exploration throughout the district. De Beers Canada Exploration Inc. (formerly Monopros Limited) extracted a 9400 tonne bulk sample from the Victor kimberlite pipe, located approximately 100 km west of Attawapiskat for diamond evaluation. In the Wawa area, new diamond discoveries continued to be reported.

While palladium has historically been valued at one third the price of platinum, towards year end, changing supply and demand patterns resulted in palladium soaring to $900 (US) per ounce versus $600 for platinum. The dramatic price increase for the platinum group elements stimulated new exploration for these metals.

Both gold and base metals continued to be sought in the district by several companies. Gold production continued at the Dome and Hoyle Pond mines in Timmins and at the Eagle River and Edwards mines near Wawa. Preliminary work towards accessing deep copper and zinc ore at the Kidd Creek Mine began after a positive feasibility study. On completion, the Kidd Creek Mine will be the deepest base metal mine in the world.

In total, about 80 exploration programs were active throughout the Timmins district. Claim staking activities showed a 15% decrease while assessment value declined sharply over the previous year as indicated in Table 1.

Mining and exploration activities for the Sault Ste Marie District and the Wawa area are described in separate chapters within this report.

MINING ACTIVITY

Agrium Inc. completed their first full year of production of phosphate for fertilizer from the Kapuskasing Phosphate Operations located 30 km southwest of Kapuskasing.

Gold production continued in Timmins at Placer Dome Inc. – Dome Mine and at Kinross Gold Corporation – Hoyle Pond Mine. St. Andrew Goldfields Ltd. briefly brought the Stock Mine into production but ceased mining operations before year end. At the Stock Mine, milling of gold ore trucked from the Hislop pit in Hislop Township, Kirkland Lake District was suspended in November along with the Stock Mine closure.

Timmins District - 2000

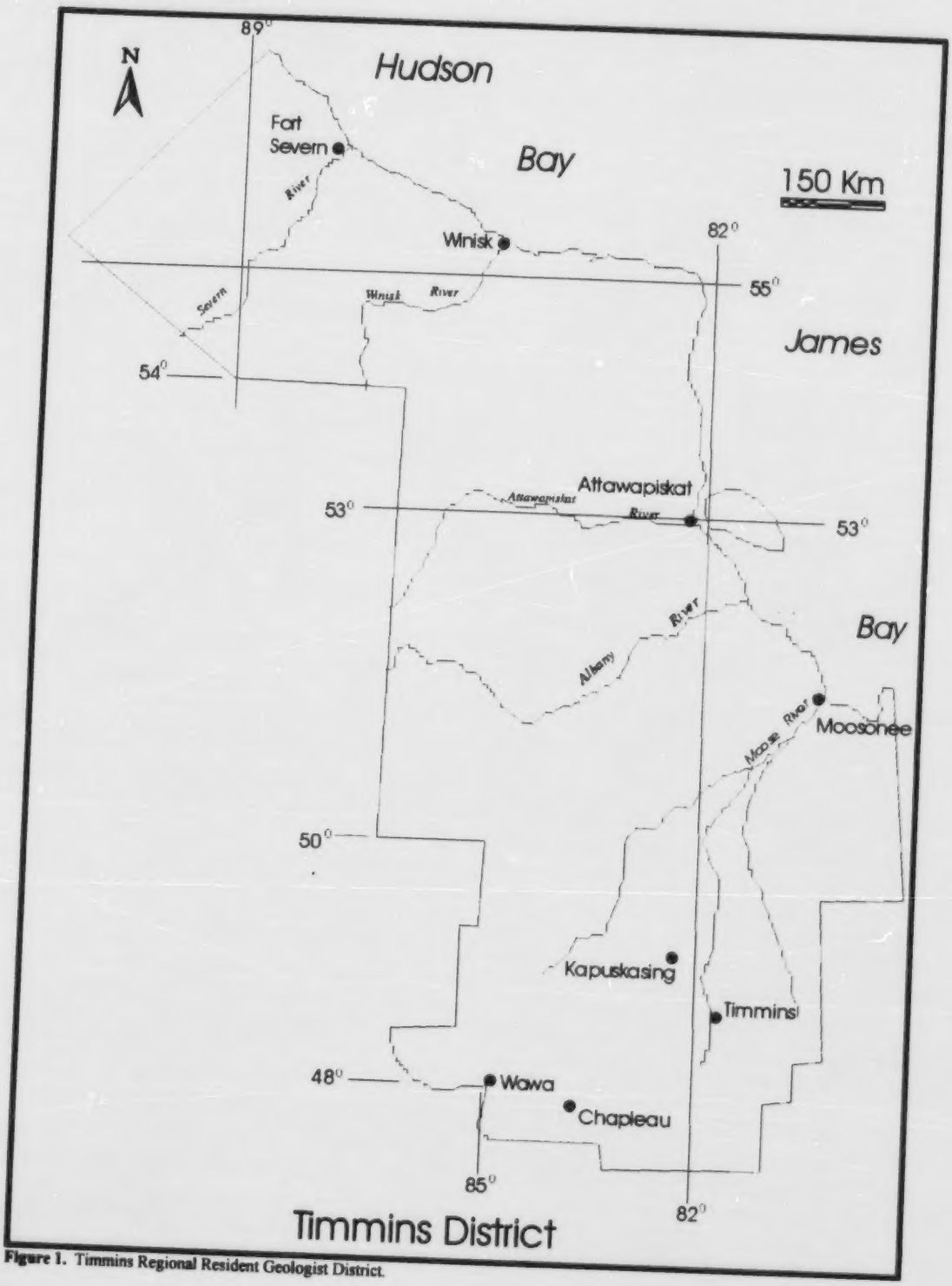

Figure 1. Timmins Regional Resident Geologist District.

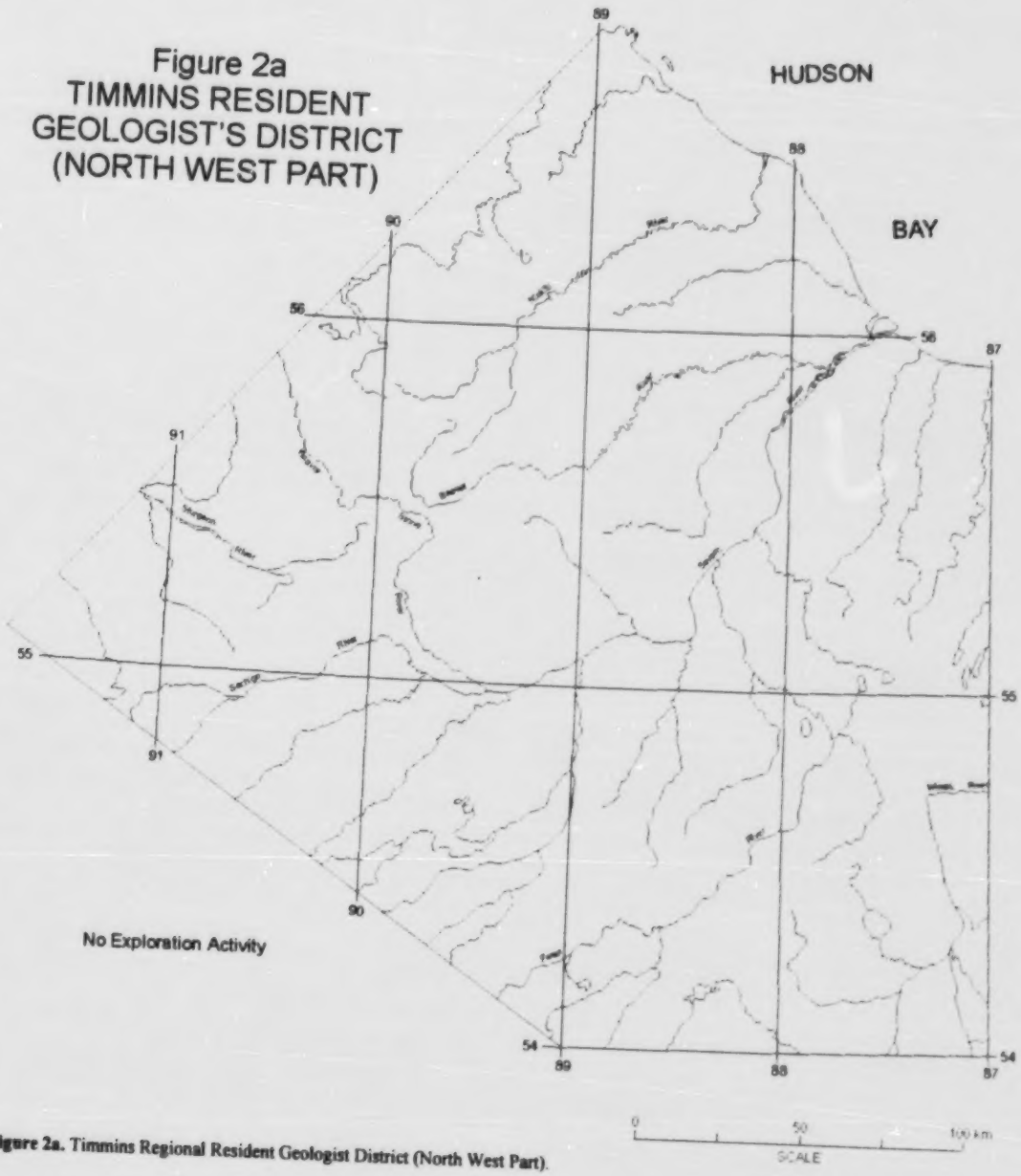

Figure 2a. Timmins Regional Resident Geologist District (North West Part).

Figure 2b
TIMMINS RESIDENT GEOLOGIST'S DISTRICT (NORTH EAST PART)

No Exploration Activity

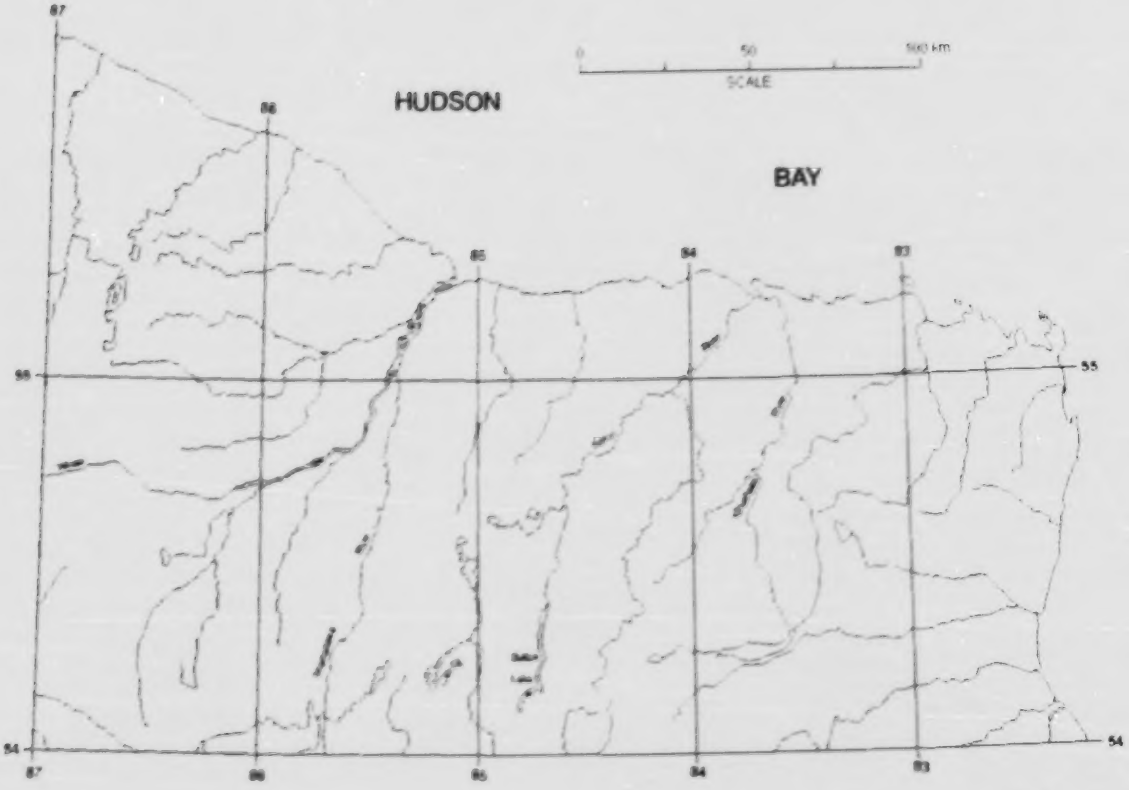

Figure 2b. Timmins Regional Resident Geologist District (North East Part).

Figure 2c TIMMINS RESIDENT GEOLOGIST'S DISTRICT (WEST CENTRAL PART)

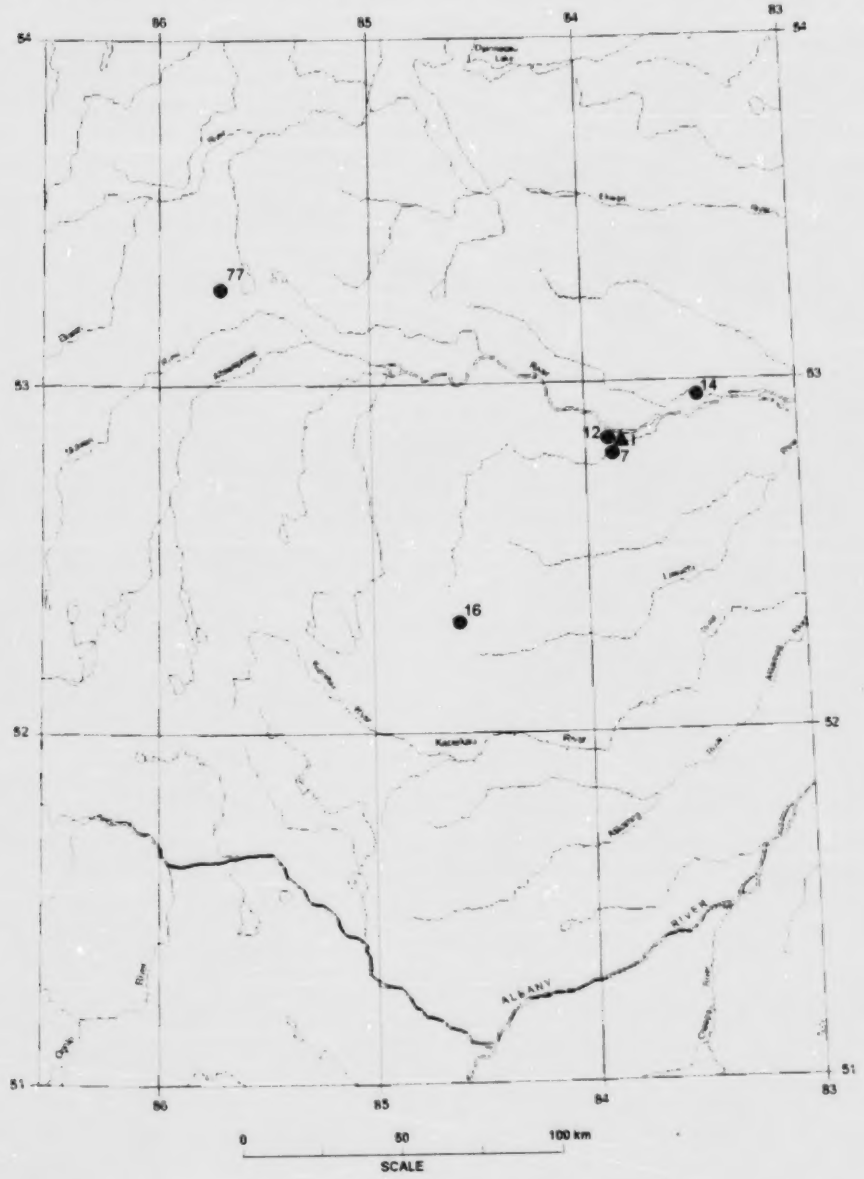

Figure 2c. Timmins Regional Resident Geologist District (West Central Part)

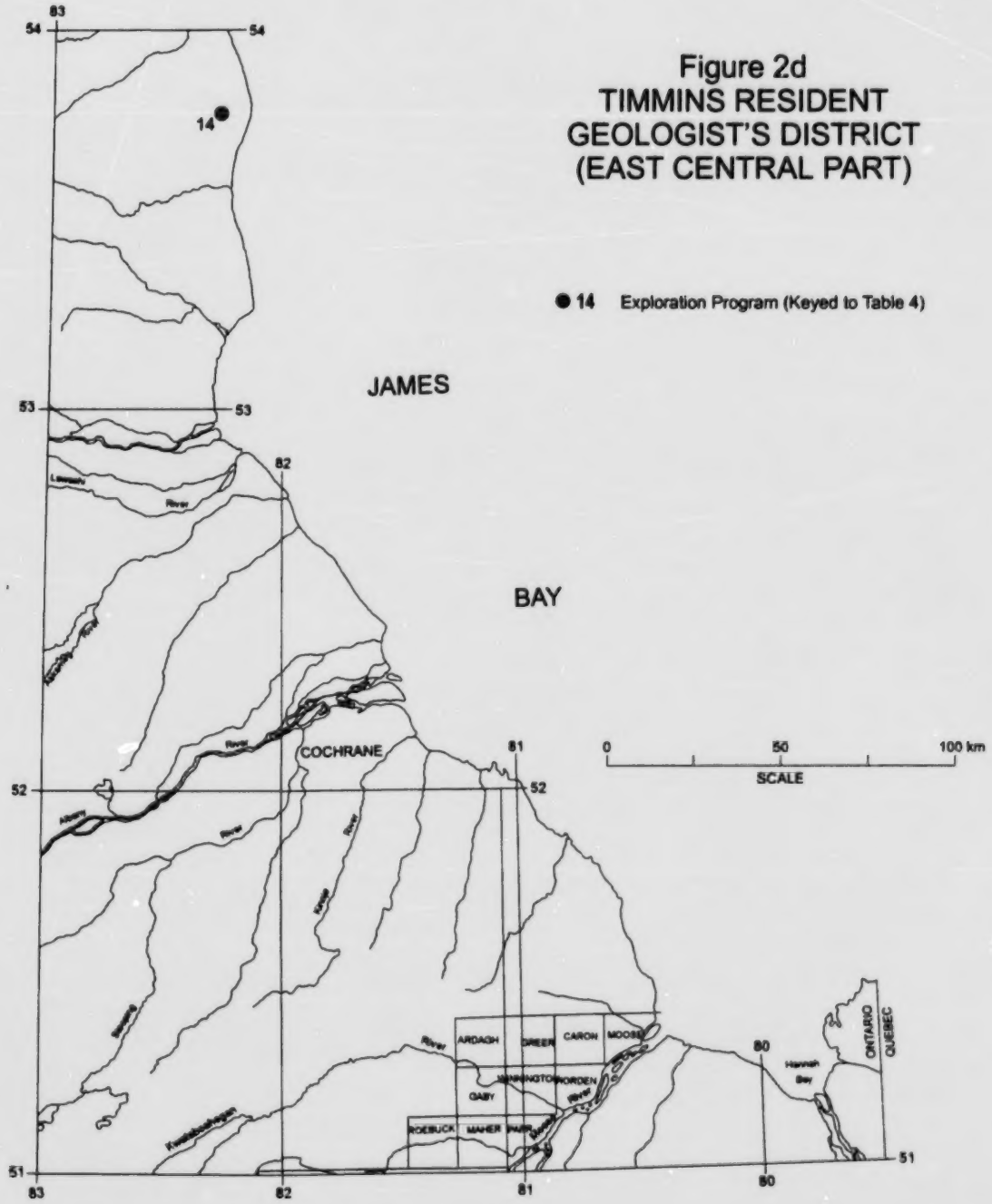

Figure 2d. Timmins Regional Resident Geologist District (East Central Part)

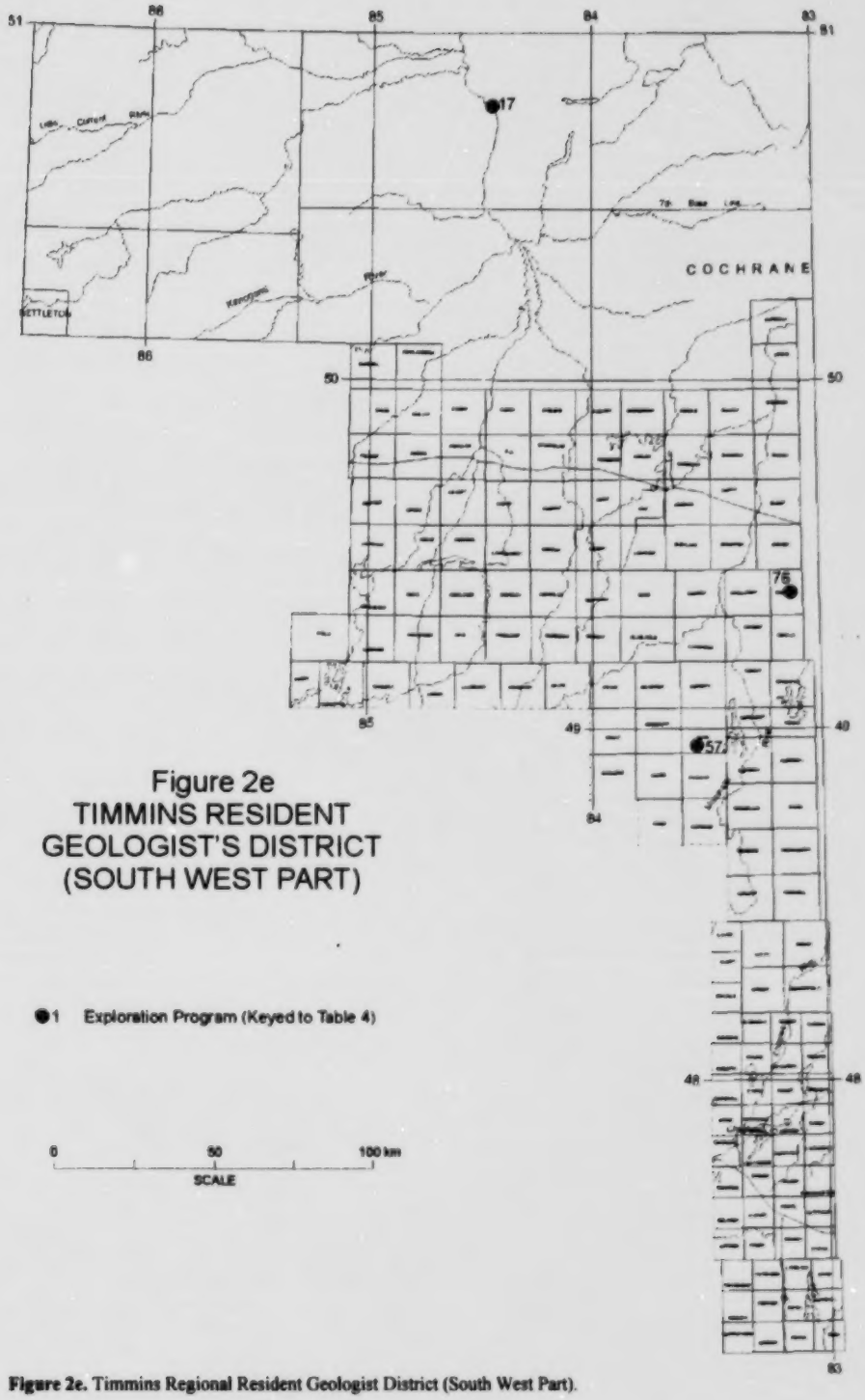

Figure 2e
TIMMINS RESIDENT
GEOLOGIST'S DISTRICT
(SOUTH WEST PART)

●1 Exploration Program (Keyed to Table 4)

0 50 100 km
SCALE

Figure 2e. Timmins Regional Resident Geologist District (South West Part).

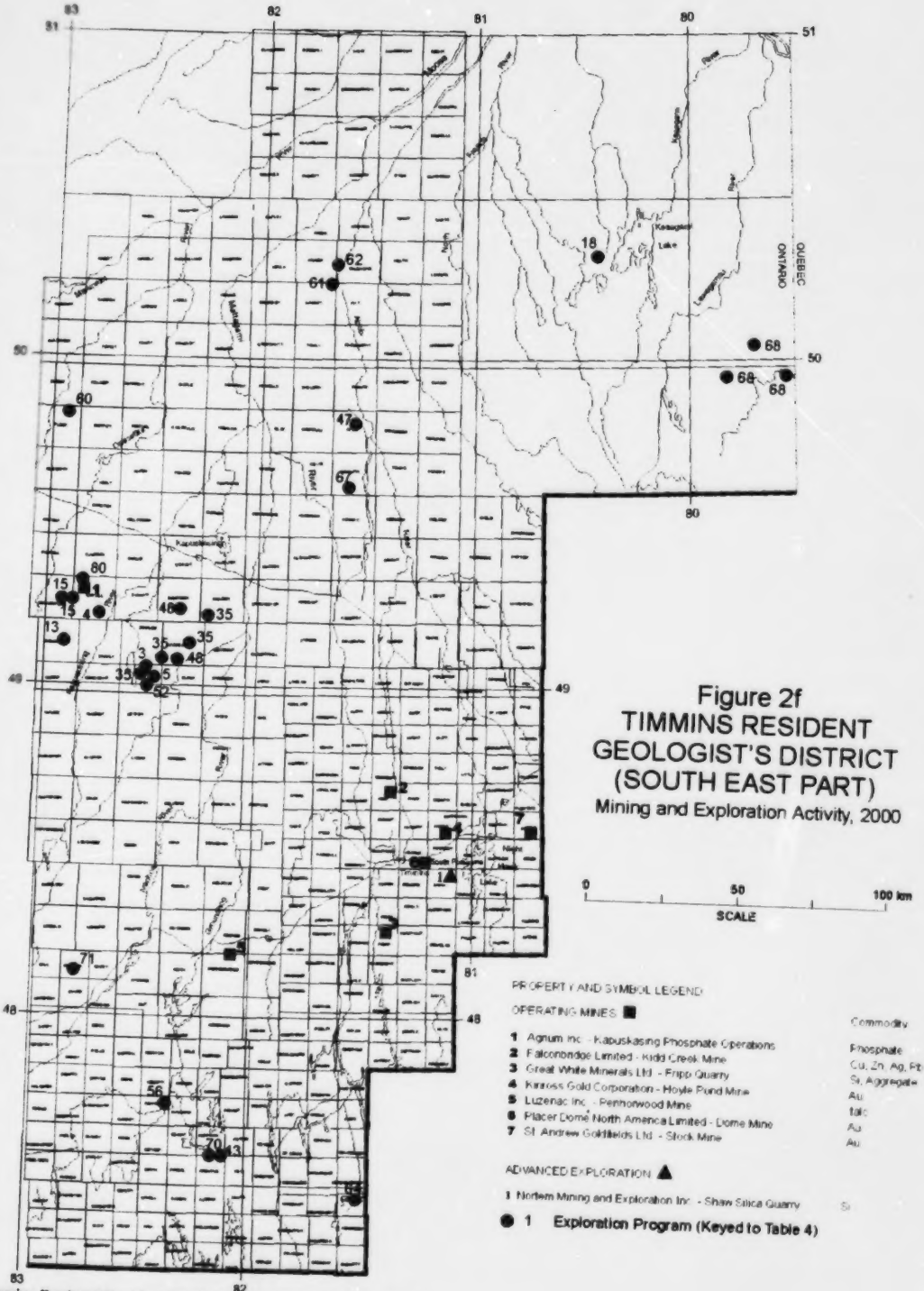

Figure 2f. Timmins Regional Resident Geologist District (South East Part).

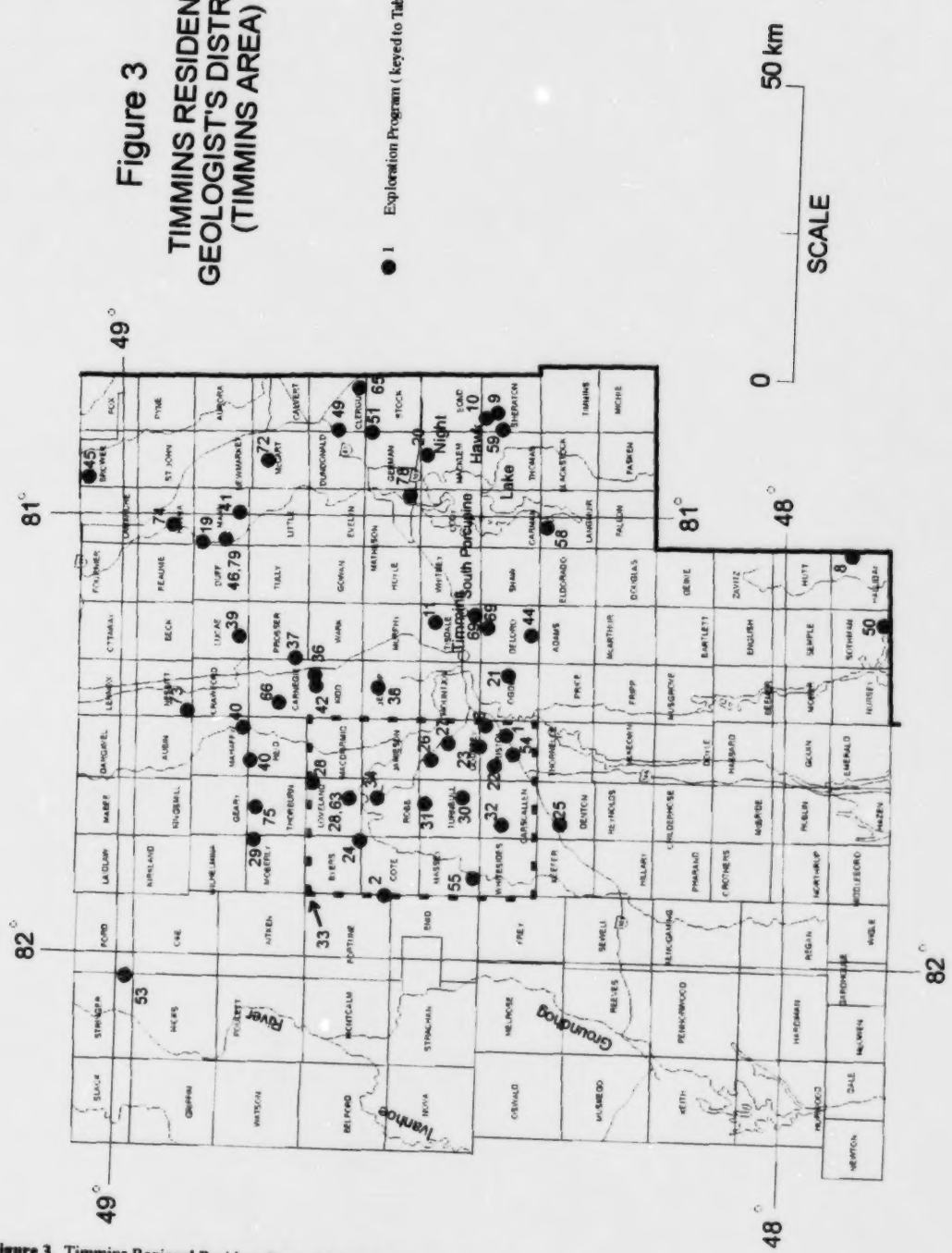

Figure 3. Timmins Regional Resident Geologist District (Timmins Area).

Table 1. Summary of claims recorded and assessment work credit in the Timmins District, 1995 – 2000.

Year	Claim Units Recorded	Claim Units Cancelled	Claim Units Active	Diamond Drilling ($)	Physical Work ($)	Geotechnical Work* ($)	Total ($)
2000	11 035	15 723	35 905	N/A	N/A	N/A	4 946 371
1999	12 312	16 557	42 270	N/A	N/A	N/A	10 665 577
1998	12 642	11 300	46 515	N/A	N/A	N/A	17 308 110
1997	10 771	16 908	45 173	N/A	N/A	N/A	10 707 864
1996	13 859	15 876	50 739	4 788 424	216 812	3 288 156	8 418 072
1995	14 376	7 769	60 705	2 003 632	202 191	2 742 497	5 052 359

** As of 1992, Geological and Geophysical Survey data are combined as Geotechnical Work*
N/A *Not available, figures no longer reported separately as of 1997.*

Falconbridge Limited continued to mine at the Kidd Creek Mine and to mill, smelt and refine ore at the Kidd Metallurgical Complex located in Hoyle Township. Preliminary work is underway to develop deep ore reserves between the 2100 m to 3100 m levels at the mine.

Luzenac Inc. expanded talc production at their Penhorwood Mine, located 80 km west of Timmins in Penhorwood Township. Talc concentrate is trucked from the minesite to their mill in Timmins for processing and microgrinding into various talc products.

Silica production continued from the Fripp Township quarry by Great White Silica Minerals Ltd. and commenced from the Shaw Township quarry operated by Nortem Mining and Exploration Inc.

Base Metal Mining

FALCONBRIDGE LIMITED – KIDD CREEK MINE

As a result of continued exploration of the base metal orebody at the Kidd Creek Mine over the last five years, followed by a detailed feasibility study, Falconbridge commenced development to access ore between the 68 and 102 levels (2100 m to 3200 m below surface). Production from the deep levels, referred to as the "D" Mine is scheduled to begin in 2004. Development will include two new internal shafts and a ramp, ore handling facilities, a paste plant for backfill and a refrigeration plant to cool mine air at depth. The projected cost of the development is $640 million.

Production amounted to 2 275 000 tonnes of ore grading 2.49% copper, 4.50% zinc 0.11% lead and 47 g/t silver. The daily milling rate was 6287 tonnes. Mill recovery was 95.2% Cu, 82.9% Zn and 72% Ag.

Ore reserves at year end are:

Category	Tonnes	Copper %	Zinc %	Lead %	Silver g/t
Proven	16 971 000	2.27	5.62	0.24	70
Probable	10 285 000	2.25	6.98	0.19	54
Total	27 256 000	2.26	6.13	0.22	64

The principle mining method was blast hole open stoping with delayed cemented rock fill. Mining was active on 62 levels and included 5157 m of drifting and 3323 m of raising.

The Kidd Creek Mine employs 612 people and the metallurgical operations employ an additional 865 people. D. Gignac is the General Manager of the Mining Division, C. Ferron is the General Manager of the Metallurgical Division and D. Duff is the Chief Geologist.

Gold Mining

KINROSS GOLD CORPORATION – HOYLE POND MINE

Production from the Hoyle Pond Mine was 140 036 ounces of gold from 460 576 tonnes of ore. The ore grade was 11.27 grams per tonne and the mill achieved a recovery rate of 83.9%. The daily milling rate was 1258 tonnes.

Ore reserves at the end of 1999 were 1 195 271 tonnes grading 11.69 g/t including:

	Tonnes	Grade (Gold g/t)
Proven:	279 255	12.82
Probable:	389 757	11.29
Possible:	526 259	11.39

Underground mining operations included 10 938 m of drifting and 1745 m of raising. Mining was active on 50 headings using longhole, shrinkage, paste cut and fill and panel mining methods. Drilling amounted to 30 534 m for ore definition and 68 072 m of exploration drilling. Exploration expenditures totalled $3.1 million and continued to expand existing reserves. The main 1060 ramp was extended towards the shaft-accessible lower level at 720 m. At year end the ramp down to the 600 m level. The mine employs 433 people including contractors. G. Halverson is the Mine Manager and A. Still is the Chief Geologist.

PLACER DOME INC. – DOME MINE

At the Dome Mine, gold production amounted to 313 904 ounces gold from 4 667 332 tons milled. The ore grade was 0.073 ounce per ton gold and the daily milling rate was 12 787 tons per day. The mill recovery rate was 92.25%.

Ore reserves at year end were:

	Tons	Grade (ounce per ton)
Proven	11 032 000	0.036
Probable	19 516 000	0.059
Total	30 547 000	0.052

Mining operations included open pit, and underground long hole stoping and cut and fill methods. Underground operations totalled 17 757 feet of drifting and 1357 feet of raising while underground drilling included 91 023 feet of ore definition and 119 403 feet of exploration drilling. There were 43 active headings including 15 development, 20 stoping, 6 diamond drilling and 2 for construction. Surface exploration drilling totalled 16 716 feet.
The redesigning of stopes around and amongst existing operations has significantly increased underground ore reserves. Demolition and closure of the Preston Mine and mill site was completed with removal of all related materials and the shaft was backfilled. The Porcupine Lake pumphouse was decommissioned and mining tailings reclamation continued.

Exploration continued on the wholly owned Preston and Paymaster properties in Tisdale and Deloro townships and the Vedron property was taken under option. Exploration work included stripping, geological mapping, sampling and diamond drilling of 26 holes totalling 16 716 feet.

The Dome Mine employs 508 people in the mining and milling operations. K. Boyle is the Mine Manager and M. Shannon is the Chief Geologist.

ST. ANDREW GOLDFIELDS LTD. – STOCK MINE

The Stock Mine, located in Stock Township, 50 km east of Timmins, produced 337 662 grams of gold (10 855.8 troy ounces) from 57 429 tonnes of ore. The mine grade was 5.88 g/t Au and the milling rate was 1000 tonnes per day, achieving 95.17% gold recovery.

Mining operations included 380 m of drifting, 122 m of raising and 963 m of underground drilling. Mining methods included longhole and shrinkage mining on three levels. While in operation, the Stock Mine had a workforce of 98 people. Operations were suspended on November 28, 2000 and placed on a care and maintenance basis.

Industrial Mineral Production

AGRIUM INC. – KAPUSKASING PHOSPHATE OPERATIONS

As Ontario's only current producer of phosphate, Agrium Inc.'s Kapuskasing Phosphate Operations completed their first full year of production. Apatite is mined from a residual deposit of weathered carbonatite in an open pit operation. An apatite concentrate is produced on site then shipped by rail to Agrium's Redwater, Alberta fertilizer plant for processing into fertilizer.

Phosphate production amounted to 486 000 tonnes from 1 097 000 tonnes milled at a grade of 31.4% P_2O_5. Proven and probable ore reserves are 19 920 000 tonnes with a grade of 28 % P_2O_5. Mining is done by conventional open pit. Surface drilling included 15 391 m for ore definition and 2483 m of exploration drilling.

Commissioning of a new crushing plant, an upgrade to the power plant system and additions and modifications to the milling circuit were completed. Removal of clay overburden from the main pit continued in preparation for mining operations. Site preparation and permitting for a 1.5 km diversion of Lost River to expand the pit operations in 2002 is underway. The height of the tailings dam was raised by 1 m.

Agrium has a workforce of 60 people and an additional 110 contractors work on site. A. Watson is the mine Manager and R. Pressacco is the Mine Geologist.

GREAT WHITE MINERALS LTD. – FRIPP SILICA QUARRY

Quartz material was produced from the Fripp Township quarry for various applications requiring high silica content. Silica feedstock was produced for local and US markets. The quarry operated throughout the year.

LUZENAC INC. – PENHORWOOD MINE

At the Penhorwood Mine, talc production increased to 60 342 tons from 220 018 tons milled. The talc grade was 46.9% and the milling rate was 600 tons per day. Talc recovery amounted to 58.5%. Talc concentrate is trucked to mill and microgrinding facilities in Timmins for processing into a wide variety of talc products. Measured reserves are 14 629 902 tons grading 48.5% talc and indicated reserves are 5 900 037 tons at 48.5% talc.
Open pit mining operations are contracted out. Surface drilling for ore definition amounted to 1888 m.
The mill is undergoing expansion from 40 000 tons to 60 000 tons per year. Mill additions included a Knelson concentrator and a regrind mill to improve talc recovery.

The mine employs a work force of 19 people and milling operations employ 36 people. K. Tyler is the Mine Manager.

Table 2. Mine production and reserves in the Timmins District.

Mine	Production in 1999		Production in 2000		Reserves at end of 2000	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
Falconbridge Limited, Kidd Creek Mine	2 424 471 tonnes @: 2.85% Cu, 5.04% Zn, 0.11% Pb 61 g/t Ag	102 047 tonnes Zn concentrate 86 157 tonnes Cu concentrate 4 300 000 oz Ag	2 275 000 tonnes @: 2.49% Cu, 4.5% Zn, 0.11% Pb, 47 g/t Ag	102 375 tonnes Zn 56 648 tonnes Cu 3 437 638 oz Ag	27 256 000 tonnes** incl: proven 16 971 000t probable 10 285 000t	2.26% Cu, 6.13% Zn, 0.22 % Pb, 64 g/t Ag
Kinross Gold Corporation, Hoyle Pond Mine	419 108 tonnes @ 11.51 g/t	136 328 oz Au	460 576 tonnes @ 11.27 g/t Au	140 036 oz Au	Not available	Not available
Luzenac Incorporated, Penhorwood Mine	170 000 tonnes @ 45 – 50% talc	50 000 tonnes talc	220 018 tons @ 46.9% talc	60 342 tons talc	14 629 902 tons measured and 5 900 037 tons indicated	48.5% talc
Placer Dome North America - Detour Lake Mine	620 520 tonnes @ 3.38 g/t	61 453 oz Au			-	-
Placer Dome North America - Dome Mine	4 747 323 tons @ 0.074 opt Au	328 149 oz Au	4 667 332 tons @ 0.073 opt Au	313 904 oz Au	30 547 000 tons* incl 11 032 000 tons proven 19 516000 tons probable *	0.052 opt Au
St . Andrew Goldfields Ltd. Stock Mine			57 429 tonnes @ 5.88 g/t Au	10 855.8 oz Au (337 662 gm)	Not available	Not available

Notes:
Abbreviations: N/A – Data not available; g/t – grams per tonne; opt – ounces per ton.
** Proven and probable reserves*
*** Total of proven, probable and possible reserves.*
1999 Reserve figures for Hoyle Pond Mine are not available.
Reserve figures indicated for Pamour Mine are 1998 data.

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Table 3. Gold Production in the Timmins Regional Resident Geologist District to the end of 2000.

Mine Name	Township	In Production	Tons Milled	Oz. Au	Grade
Ankerite/March	Deloro	1926-1935	317 769	61 039	0.19
Aquarius	Macklem	1984, 1988-89	139 634	27 117	0.19
Aumor Pamour(#3)	Deloro	1940-1984	8 482 174	2 502 214	0.30
Banner	Whitney	1927-28,-33,-35	313	670	0.13
Bell Creek	Hoyle	1987-91, 1992-94	576 017	112 739	0.196
Bonetal	Whitney	1941-51	352 254	51 310	0.15
Borewhit	Whitney	1951-54	200 553	67 940	0.34
Broulan Porcupine	Whitney	1939-1953	1 146 059	240 660	0.21
Broulan Reef Mine	Whitney	1915-65	2 144 507	498 932	0.23
Buffalo Ankerite	Deloro	1926-53, 78	4 993 929	937 292	0.19
Cincinnati	Deloro	1914, 1922-24	3 200	736	0.23
Concordia	Deloro	1935	230	16	0.07
Consarum/Carnum	Tisdale	1913-18, 1928-61	4 464 006	1 109 574	0.25
Crown	Tisdale	1913-21	226 180	138 330	0.61
Davidson-Tisdale	Tisdale	1918-20, 1988	53 221	2 438	0.26
Delnite	Deloro	1937-64	3 847 364	920 404	0.20
(open pit)		1987-88	56 867	3 602	0.77
DeSantis	Ogden	1933, 39-42, 61-64	196 928	35 842	0.18
Detour Lake	Sunday Lake Area	1983-99	16 005 357	1 781 858	0.111
Dome	Tisdale	1910	79 854 379	14 234 800	0.178
Faymar	Deloro	1960-62	119 181	21 831	0.180
Fuller (Vedron)	Tisdale	1940-44	44 038	6 566	0.15
Gillies Lake	Tisdale	1921-31, 35-37	54 502	15 278	0.28
Goldhawk	Cody	1947	636	53	0.08
(open pit)		1980	40 000	3 967	0.10
Halcrow-Swayze	Halcrow	1935	211	40	0.19
Hallnor (Pamour #2)	Whitney	1938-68, 81	4 226 419	1 690 560	0.40
Hollinger- Schumacher	Tisdale	1915-1918	112 124	27 182	0.24
Hollinger	Tisdale	1910-68	65 778 234	19 327 691	0.29
Pamour Timmins Property		1976-88	2 615 866	182 098	0.07
Hoyle – Falconbridge	Whitney	1941-44,46-49	725 494	71 843	0.10
Hoyle Pond	Hoyle	1985-	3 648 462	1 439 674	0.40
Hugh-Pam	Whitney	1926, 48-65	636 751	119 604	0.19
Jerome	Osway	1941-43, 56	335 060	56 893	0.17
Joburke	Keith	1973-75, 79-81	440 117	43 571	0.10
Kingbridge/Gomak	Chester	1935-36	1 387	98	0.07
Marbell	Hoyle	1989-91	196 800	30 924	0.199
McIntyre Pamour Schumacher	Tisdale	1912-88	37 634 691	10 751 941	0.29
(ERG Tailings recovery)		1988-89	2 549 189	18 280	
McLaren	Deloro	1933-37	876	201	0.23
Moneta	Tisdale	1938-43	314 829	149 250	0.47
Naybob (Kenilworth)	Ogden	1932-64	304 100	50 731	0.17
Nighthawk	Macklem	1995-99	1 479 607	175 903	0.12
Owl Creek	Hoyle	1981-89	1 984 400	236 880	0.12
Pamour #1 (Incl. pits 3, 4 & 7)Hoyle	Whitney	1936-99	45 795 863	4 078 525	0.09
Pamour (other sources)	Whitney	1936-99	7 416 634	676 645	0.091
Paymaster	Deloro	1915-19, 23-66	5 607 402	1 192 206	0.21
Porcupine Lake (Hunter)	Whitney	1937- 40,- 44	10 831	1 369	0.13
Porcupine Peninsular	Cody	1924-27,-40,-47	99 688	27 354	0.27
Preston	Tisdale	1938-68	6 284 405	1 539 355	0.24
Preston NY	Tisdale	1933	2 800	153	0.05
Preston/Porcupine Pet	Deloro	1914-15	NA	314	
Preston/Porphyry Hill	Deloro	1913-15	46	312	6.78
St. Andrew Goldfields - Stock	Stock	1989-94, 2000	813 429	129 856	0.16
Tonaga/Smith Thorne	Harwood	1938-39	6 633	2 299	0.35
Tisdale Ankerite	Tisdale	1932	14 633	2 236	0.15
Tommy Burns/ Arcadia	Shaw	1917	21	14	0.28
Vipond	Tisdale	1911-41	1 565 218	414 367	0.26
*** Grade: ounce gold per ton**	**Total**		**313 791 331**	**66 340 938**	**0.211**

Table 3a. Base metal production from the Timmins Regional Resident Geologist District to the end of 2000.

Mine Name	Township	In Production	Ore Milled	Grades
Alexo	Dundonald	1912-19 1943-44	51 857 tons 4 923 tons	4.5% Ni, 0.55% Cu
Canadian Jamieson	Godfrey	1966-71	816 173 tons	2.44% Cu, 4.22% Zn
Jameland	Jamieson	1969-72	509 356 tons	0.99% Cu, 0.88% Zn
Kam Kotia	Robb	1943-44 1961-72	6.6 Mtons	1.1% Cu, 1.17% Zn, 0.10 oz/T Ag
Kidd Creek	Kidd	1966-	131.975 Mtonnes	2.40% Cu, 6.59% Zn, 0.267% Pb, 82.4 g/t Ag
Langmuir #1	Langmuir	1990-91	111 502 tons	1.74% Ni
Langmuir #2	Langmuir	1972-78	1.1 Mtons	1.43% Ni
McIntyre	Tisdale	1963-82	10 Mtons	0.67% Cu
Redstone	Eldorado	1989-92 1995-96	294 895 tons 10 228 tons	2.4% Ni 1.7% Ni
United Obaliski	Godfrey	1966	Produced 240 tons Cu concentrate	

ADVANCED EXPLORATION

De Beers Canada Exploration Inc.

De Beers Canada Exploration Inc. (formerly Monopros Limited) completed bulk sampling of approximately 9400 tonnes of diamondiferous kimberlite from the Victor project located 100 km west of Attawapiskat. Kimberlite material was extracted from two surface trenches and from nine large diameter (24 inch) drill holes to a depth of 200 m. A small modular processing mill was erected on site for processing the kimberlite for further evaluation of the diamond content. The diamond concentrate was shipped to De Beers' laboratories in Johannesburg, South Africa for evaluation.

Nortem Mining and Exploration Inc. – Shaw Silica Quarry

Nortem Mining and Exploration Inc. continued development on the Shaw Township silica quarry. Work included construction of a new access road to the site and test sampling of material. The quarry is situated on unpatented mining claim 1229264. A bulk sample of quartz rock was shipped to the Kidd Metallurgical Complex for evaluation as a fluxing agent in the Kidd smelter.

Table 4. Exploration activity in the Timmins District in 2000. (Keyed to Figures 2c, 2d, 2e, 2f and 3)

Abbreviations

AEM	Airborne electromagnetic survey
Ag	Silver
AM	Airborne magnetic survey
ARES	Airborne resistivity survey
Au	Gold
Beep	Beep Mat survey
BM	Base Metals
Bulk	Bulk sampling
Co	Cobalt
Compln	Data compilation
Cu	Copper
DD	Diamond drilling
GT	Geotechnical surveyey
HLEM	Horizontal loop electromagnetic surveyey
HM	Heavy mineral samplingng
IM	Industrial mineral testing and marketingng
IP	Induced polarization surveyey
JV	Joint venture
Lc	Linecutting
MMI	Mobile Metal Ion survey
Ni	Nickel
OD	Overburden drilling
PEM	Pulse electromagnetic survey
PGM	Platinum group metals

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DGP	Down-hole geophysics	Pr	Prospecting
GC	Geochemical survey	Samp	Sampling (other than bulk)
GEM	Ground electromagnetic survey	Str	Stripping
GL	Geological Survey	TEM	Transient electromagnetic survey
GM	Ground magnetic survey	Tr	Trenching
GP	Ground geophysical survey	VLFEM	Very low frequency electromagnetic survey
GPS	Global Positioning System survey	Zn	Zinc

No	Company/Individual(Occurrence Name)or Property	Township/Area(Commodity)	Exploration Activity
1	Aube, A.	Bristol (Au)	Lc, GM
2	Barber, R.A. & Daigle, R.	Côté, Fortune (Au, BM, PGM)	Lc, Assays, GL, IP, Pr
3	Berland Resources Ltd.	Fenton (BM)	Lc, Pr, Samp, GM
4	Berland Resources Ltd.	Cargill (BM)	Pr, Samp
5	BRC Development Corporation	Fenton (diamond)	OD - 35 - 700m, HM
6	Cameco Corporation	Bristol (Au)	Lc, GM, GPS, IP, DD - 7 - 1747m
7	Canabrava Diamond Corporation / Navigator Exploration Corporation (Severn Project)	BMA 527834, et al. (diamond)	AM, GP, GL, Samp
8	Canadian Arrow Mines Ltd.	Halliday (BM)	Lc, IP
9	Cross Lake Minerals Ltd. (Sheraton – Timmins Property)	Sheraton (BM)	MMI, DD - 1 - 739m, Assays, DGP
10	Cross Lake Minerals Ltd. (Night Hawk Lake Joint Venture)	Sheraton (BM)	MMI
11	Davidson Tisdale Ltd.	Tisdale (Au)	DD – 6 – 1230m
12	De Beers Canada Exploration Inc. (Victor Project)	BMA 527834 (diamond)	GL, Bulk, DD - 34 - 7970m, GT logging, HM
13	Dia Bras Exploration Inc.	Bourinot (diamond)	AEM, AM, ARES, Lc, DD - 3 - 302m, GM, HLEM
14	Dia Bras Exploration Inc.	BMA 528832, BMA 536822, BMA 537822 (diamond)	AM, AEM, OD, GM
15	Diadem Resources (Silverman, G.C. / Gemcal Prospecting Syndicate) (KAP Property)	Cargill, Ecclestone (diamond, PGM)	Lc, GM, VLFEM, Samp, Assays, GC, HM, MMI
16	Dumont Nickel Inc.	BMA 523843, et al. (10 areas) (diamond)	AM
17	Dumont Nickel Inc. / North Atlantic Nickel Corporation (Albany Project)	West of Trilsbeck Lake (diamond, PGM, Ni, Cu)	AM, GEM, DD - 3 - 1707m
18	Eastmain Resources Inc. / Quaterra Resources Inc. (Nett River property)	Nettogami River, et al. (Au, Ni, Cu, PGM)	Lc, GM, HLEM, GC, DD - 17 - 1966m, Assays
19	East West Resource Corporation (Reaume Project)	Duff, Mann (BM, PGM)	Lc, IP
20	Echo Bay Mines Ltd. (Aquarius Mine property)	Macklem (Au)	DD - 10 - 1567m
21	Echo Bay Mines Ltd.	Ogden (Au)	GC, GL, Samp, Assays
22	Explorers Alliance Corporation	Bristol (Au, BM)	DD - 2- 555m, Assays
23	Explorers Alliance Corporation (KM2 Grid, East)	Bristol, Godfrey (Au, BM)	Lc, GM, HLEM, DD - 1 - 402m
24	Explorers Alliance Corporation	Byers, Côté (Au, BM)	DD - 1 - 156m
25	Explorers Alliance Corporation	Denton (Au, BM)	Lc, IP, DD – 2 – 537m
26	Explorers Alliance Corporation (Hollinger – Falconbridge Grid)	Godfrey (BM)	HLEM, DD - 3 - 591m
27	Explorers Alliance Corporation (Waterhen Grid)	Godfrey (BM)	Lc, GM, HLEM
28	Explorers Alliance Corporation	Loveland (Cu, Ni, Co, PGM)	Compln, GM, DD – 8 - 1665m, Assays,

No	Company/Individual(Occurrence Name)or Property	Township/Area(Commodity)	Exploration Activity
			PEM
29	Explorers Alliance Corporation (Lalonde Option)	Moberly (Au)	DD - 2 – 315m
30	Explorers Alliance Corporation (Cambior Option)	Turnbull (Au, BM)	DD - 4 – 986m, Assays
31	Explorers Alliance Corporation	Turnbull (Au, BM)	Lc, GM, HLEM
32	Explorers Alliance Corporation / Falconbridge Limited	Carscallen (BM)	Lc, IP, DD - 1 - 372m
33	Explorers Alliance Corporation / Prospectors Alliance Corporation (Timmins West property)	Bristol, et al. (BM)	AEM
34	Explorers Alliance Corporation / Prospectors Alliance Corporation (Half Moon Lake property)	Robb (Zn, Cu, Ag, Au)	IP, DD – 6- 1070.1m, GC, Assays
35	Falconbridge Limited (Saganash Project)	Casselman, Nansen, Fenton (BM)	Lc, GM, HLEM, Beep, GL, DD - 868m
36	Falconbridge Limited	Kidd (BM)	DD - 2 - 2617m, Assays, GC
37	Falconbridge Limited (Kidd Core properties)	Kidd, Carnegie, Prosser (BM)	DD - 10,523m
38	Falconbridge Limited	Jessop (BM, Au)	DD - 1 - 236m, Assays, GC
39	Falconbridge Limited	Lucas (Au, BM)	Lc, GM, HLEM
40	Falconbridge Limited (Timmins West properties)	Mahaffy, Reid (Au, BM)	DD - 4278m, DGP
41	Falconbridge Limited	Mann (Au, BM)	DD - 657m
42	Falconbridge Limited / Opawica Explorations Inc. JV (Whitestar South property)	Kidd (BM)	DD – 2 – 2187m, DGP
43	Gagne, M.Y. (Valcor Property)	Huffman (Au)	DD - 4 - 569ft
44	Globex Mining Enterprises Inc. (West Magnesite Zone)	Deloro (talc-magnesite)	Samp, GC, DD - 2 - 163m
45	Haire, P.G.	Brower (Au)	Samp, GC (Vegetation survey)
46	Hill, L.E.	Duff, Mann (Ni, Cu, PGM, Au)	DD - 1 - 200m, Assays, GL, Samp
47	Hinterland Exploration Ltd.	Avon (PGM, BM)	Lc, GM, IP
48	Hinzer, J., Dirks, P.P. & Dirks, P.J.	Casselman, Swanson (diamond)	HM, GM, Pr, Samp
49	Hucamp Mines Limited (Alexo –Dundonald; Dundonald Beach; Dundeal; Terminus; Casey properties)	Dundonald, Clergue (PGM, Ni, Cu, Zn)	Lc, Pr, Tr, Str, Samp, Assays, GM, HLEM, Compln
50	Hucamp Mines Limited	Sothman (Ni, Cu, Co, Au, PGM)	Str, Samp, Assays, GM
51	Kinross Gold Corporation / United Tex-Sol Mines Inc. (Clavos property)	Stock, German (Au)	Lc, DD – 33 – 10,157m, Assays
52	Kennecott Canada Inc. / Canabrava Diamond Corporation / Paramount Ventures and Finance Inc. (KAP North project)	Fenton (diamond)	GM. GEM, DD
53	Kennecott Canada Inc. / Canabrava Diamond Corporation / Paramount Ventures and Finance Inc. (Rocky Island project)	Ford, Stringer, Oke (diamond)	GM. GEM, Samp
54	Laforest, D. & Caron, M.	Bristol (Au)	Lc, GM, VLFEM
55	Lalonde, D.J. (Warren Property)	Massey, (Au, BM)	DD - 1 - 188m

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No	Company/Individual(Occurrence Name)or Property	Township/Area(Commodity)	Exploration Activity
56	Lashbrook, R.L.	Benton (Au, BM)	Assays, GC
57	Lecours, R.M.	Byng (Cu, Zn, Au)	Lc, GM, HLEM
58	Luhta, L.E.	Langmuir (Cu, Ni, Au, PGM)	Assays, DD - 5 - 557m
59	Maple Minerals Inc.	Thomas, Sheraton (Au)	Assays, DD - 5 - 730m, GC
60	McKinnon, D.	Fleck (PGM, BM)	DD - 4 - 275m
61	McKinnon, D. (Coral Rapids Property)	Kilmer, Hamlet (limestone)	Pr, DD - 5 - 700ft
62	McKinnon, D. (Coral Rapids Property)	Kilmer, Valentine (diamond)	GM, VLFEM
63	Meunier, D.	Loveland (Au)	Str
64	Morgan, J.H. (Westree Silica)	Garvey (silica sand)	Pr, Assays, Samp
65	Nufort Resources Inc. (East Clavos Property)	Clergue (Au, BM)	Lc, Assays, GC, GL
66	Opawica Explorations Inc. (Wigley Property)	Carnegie (BM)	Lc, DD - 1 - 329m, TEM
67	Pegg, C.C. & Meunier, D. (Island Falls Project)	Adanac, Homuth (Ni, Cu, PGM)	AEM, AM, ARES, VLFEM, GPS, HLEM, DD - 6 - 1134m
68	Pelangio Mines Inc. / Franco-Nevada Mining Corporation Limited JV	Sunday Lake, Lower Detour Lake, Hopper Lake (Au, BM)	Compln
69	Placer Dome (CLA) Limited	Tisdale (Au)	Assays, DD - 1 - 995ft
69	Placer Dome (CLA) Limited (Preston and Paymaster properties)	Deloro (Au)	Str, GL, Samp, DD - 26 - 16,716ft
70	Prospectors Alliance Corporation (South Swayze property)	Arbutus, Huffman (BM, Ag)	GP, GL, DD – 3 – 435.6m, Assays
71	Purechem Limited	Warren (alumina, silica)	IM, GC, Beneficiation study
72	Pyke, D.R. & Cunnison, K.	McCart (Ni, Cu, PGM)	Assays, Samp
73	Pyke, D.R.	Nesbitt (Au, BM, PGM, Ni)	DD - 1 - 176m, Assays
74	Queenston Mining Inc.	Hanna (Au, Cu, Zn)	DD - 1 - 200m, Assays
75	Raine, B.N.	Thorburn (Au)	DD - 1 - 152m, Assays
76	Silverman, G.C. / Gemcal Prospecting Syndicate (South Crow Creek Property)	Shearer (diamond)	HM, Samp
77	Spider Resources Inc. / KWG Resources Inc. (Kyle No. 3 property)	BMA 532854 (diamond)	DD - 7 - 1430m, Samp, HM
78	St. Andrew Goldfields Ltd.	Matheson (Au)	GC (Soil)
79	Tres-Or Resources Ltd. (Mann Project)	Duff, Mann (Ni, Cu, PGM, Au)	Samp, DD, GM, HLEM, IP, Assays
80	Viridian Inc. (Agrium Kapuskasing Project)	Cargill (phosphate)	DD - 29 - 2483m

EXPLORATION ACTIVITY

Active exploration projects underway in the Timmins District in the year 2000 are listed in Table 4. Highlights of select projects are described below.

Canabrava Diamond Corporation – Navigator Exploration Corporation – Severn Joint Venture

Following data compilation and reconnaissance-scale till sampling completed in 1999, Canabrava Diamond Corporation and Navigator Exploration Corporation staked an area of approximately 22 000 ha in the vicinity of De

Beers Canada Exploration Inc. - Victor Kimberlite Project, 100 km west of Attawapiskat. Navigator Exploration flew a detailed 8200-line kilometre aeromagnetic survey over a portion of the project area and completed till sampling to identify possible kimberlite targets. Towards year end, Navigator had initiated a second detailed 30 000-line kilometre airborne magnetic survey over another portion of the Severn Joint Venture claims.

Dumont Nickel Inc. – Albany Project

Dumont Nickel Inc. (67%) and North Atlantic Nickel Corp. (33%) are partners in a Ni-Cu-PGE project (Albany M4) in the James Bay lowlands. During the 1999-2000 exploration season, Dumont completed 4037 line kilometres of airborne magnetic surveys and 36 kilometres of ground electromagnetic surveys. The company also diamond drilled 3 holes (1707 metres), targeting the contact phase of the Proterozoic intrusive underlying over 200 m of overburden and Paleozoic limestone. Diamond drilling showed that the intrusive consists of anorthosite, diorite and granophyre hosting disseminated pyrrhotite and chalcopyrite.

In December 2000, Dumont Nickel Inc. staked an additional 20 claim groups covering circular magnetic anomalies in the vicinity of the Victor kimberlite pipe, 100 km west of Attawapiskat, and flew an airborne magnetic survey over the claims.

Eastmain Resources Inc. – Nett River Project

The Nett River project consists of 13 440 hectares of unpatented mining claims located 140 km north northeast of Cochrane and 70 km northwest of the Detour Lake Mine. The claim group is centred at approximately 50^0 23' 00" N latitude and 80^0 32' 30" W longitude. Eastmain Resources completed ground electromagnetic surveys over 236 line kilometres and diamond drilled 17 holes totalling 1966 m on the claims. Soil geochemical surveys and drill core lithogeochemistry was completed. One drill encountered layered mafic to ultramafic rocks containing up to 800 ppm nickel. Other drill holes intersected exhalative massive sulphide horizons with anomalous copper and zinc values.

Explorers Alliance Corporation

Explorers Alliance Corporation completed detailed geological mapping and compilation on their Timmins West properties in Godfrey, Jamieson and Robb Townships. Airborne magnetic and electromagnetic surveys totalling 2422 line kilometres were flown over their claims in Whitesides, Turnbull, Godfrey, Bristol, Carscallen, Denton and Keefer townships. Diamond drilling was completed on a number of properties in the search for volcanogenic massive sulphide mineralization and platinum group elements.

Explorers Alliance exploration summary:

Township	# holes	Length (m)	Linecutting (km)	HLEM (km)	Mag (km)	IP (km)
Arbutus	3	435.6				
Bristol	3	957.2	7.3	4.9	5.9	
Carscallen	2	522				16.90
Cote	2	387				
Denton	2	537				
Godfrey	3	591	3.75	3.75	3.75	
Loveland	8	1665	4.70	4.70	4.40	
Morberly	2	315				
Robb(Halfmoon)	6	1070.1				3.10

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Turnbull	4	984.2	11.90	10.40	11.60	
Whitesides	3	606				
Total	38	8070.1	27.65	23.75	26.65	20.00

In addition to the above work, Explorers Alliance was a 20% participant to work completed by Falconbridge Limited on the Timmins West properties summarized in Table 4.

Hucamp Mines Limited Alexo – Dundonald and Sothman Properties

Hucamp Mines Ltd. have under option from Outokumpu Mines Inc., the Alexo Dundonald property consisting of 48 claim units that include the Alexo Mine, and other mineral occurrences in Dundonald and Clergue townships. Hucamp Mines carried out ground magnetic and horizontal loop electromagnetic surveys, stripping, trenching and lithgeochemical sampling over the property. Four mineralized zones were stripped and sampled. These included two komatiite hosted nickel – platinum group element showings, referred to as the Dundonald Beach and Dundeal zones, and two PGE occurrences in the layered Dundonald sill, referred to as the Casey showing and the Mighty showing.

On the Sothman property, located 70 km south of Timmins in Sothman Township, Hucamp Mines completed stripping and sampling over a nickel, copper and PGE-bearing sulphide zone originally discovered by Dominion Gulf Company Ltd. in 1950.

Kennecott Canada Exploration Inc. – Canabrava Diamond Corporation and Paramount Ventures and Finance Inc. – Kap Project

Ground magnetic and electromagnetic surveys were conducted by Kennecott Canada Exploration Inc. over the Kap Central claims. The KAP project consists of 3 claim groups (65 000 ha total) located northeast of Wawa and situated along the western margin of the Kapuskasing Structural Zone. Kennecott is completing work on these properties as part of an 1999 joint venture agreement with Canabrava Diamond Corporation and Paramount Ventures and Finance. Project details are described in the Wawa and the Sault Ste. Marie sections of this report.

Purchem Limited

Purchem Limited extracted and tested a one tonne sample of anorthosite from claims 97441 and 97442 in Warren Township, located approximately 110 km southwest of Timmins. The anorthosite was tested for its suitability as a substitute for kaolin in the glass manufacturing process.

Spider Resources Inc. – KWG Resources Inc. – Kyle #3 Kimberlite Project

The Kyle #3 kimberlite is located approximately 220 km west of Attawapiskat. Spider Resources Inc. and joint venture partner KWG Resources Inc. completed a 7 hole (1429.49 m) diamond drilling program on the Kyle #3 kimberlite between March and May 2000. The program was designed to infill and expand on the available information (geology, grade and geometry) of the kimberlite along its strike length, which is estimated to be 700 m. A total of 1237.5 kg of kimberlite from the diamond drilling program yielded 1081 diamonds. Since the discovery of the kimberlite in 1995, Spider has tested the kimberlite with 12 drill holes and processed a total of 1.74 tonnes of kimberlite. To date, the Kyle #3 has yielded 1256 diamonds of which 67 are macrodiamonds. The inferred average grade of the dike is 0.92 carats per tonne (Spider Resources Inc./KWG Resources Inc., *press release*, November 28, 2000).

RESIDENT GEOLOGIST PROGRAM STAFF AND ACTIVITIES

The Timmins Regional Resident Geologist Office was staffed by B. T. Atkinson, Regional Resident Geologist, G. Wm. Seim and A. C. Wilson, District Geologists, D. M. Draper, Regional Support Geologist, and P. Hope, District Support Geologist. S. Beauchamp was employed as a contract geologist from January to March. S. Young was employed on a short term contract in June. A. Laforge worked in the Timmins office under a co-operative educational work program through Ecole Secondaire Theriault from February to June. A. Laforge and R. Hutchinson were employed under the Summer Experience Program 2000 as summer students.

The Timmins office also serves as the head office for the Northeast Ontario Regional Resident Geologist Program. J. Ireland is the Regional Manager of the program and F. Boucher and D. Egerland are the Administrative Assistants. G. Yule is the Regional Land Use Planning Geologist for Northeastern Ontario.

Table 5. Summary of staff activities, Timmins Regional Resident Geologist Office, 1998 - 2000

Activity	1998	1999	2000
Assessment files received (including donations)	269	255	244
Client visits - Office	2706	1884	1526
Client visits - Drill Core Library	133	28	64
ERLIS client sessions (non-staff)	187	102	69
Geological tours given	6	7	13
Geoscience library additions (publications; papers; maps)	299	526*	226
Property visits by staff	72	73	73
Telephone inquiries	3387	2908	2509
MDI records ADDED		161	170
MDI records UPDATED	41	921	493
MDI records DELETED		20	117

* *Elevated figure reflects addition of Wawa technical papers and theses to Timmins RRGO library*

PROPERTY EXAMINATIONS

Moss – Tremblay Nickel Showing

In 1998, Moss Resources Inc. (Moss) reported that prospecting uncovered new nickel-bearing, disseminated sulphide mineralization in komatiitic ultramafic rocks near Moray Lake in the southeast corner of Zavitz Township (Moss Resources Inc., press release, August 18, 1998). Moss later reported nickel values for 7 rock samples ranged from 680 to 1820 ppm Ni (Chartré 1998). Moss completed magnetometer and electromagnetic surveys on a grid covering their Moray Lake property, but did not report further results.

G. Seim and R. Hutchinson examined this nickel showing (Figure 4) on July 19, 2000.

LOCATION AND ACCESS

The Moss – Tremblay nickel showing is located in the southeast corner of Zavitz Township about 52 km south of Timmins. The UTM coordinates for the occurrence outcrops are (NAD 27) Zone 17, 493550 E, 5318446 N. The outcrops are less than 100m north of Wick's Road (extension of Highway 566) about 400 m west of the Moray Lake turn-off.

Access from Timmins can be gained by travelling south along the Pine Street South or the Stringer forest access road systems for about 60 km to Wick's road and then east 13 km, then 5 km along Wick's road.

GEOLOGY

E. B. Bright (1984) mapped the geology of the Ferrier Lake–Canoeshed Lake area including Zavitz Township. Felsic metavolcanic rocks (dacite to rhyodacite flows, flow breccia and pyroclastic debris) underlie the southeast corner of Zavitz Township. Mafic to ultramafic rocks (gabbro, peridotite and pyroxinite) intrude the felsic metavolcainc rocks possibly as one thin sinuous body folded about a westerly plunging synclinal axis.

The Moss – Tremblay nickel showing occurs on the south limb of the syncline at the contact of the ultramafic intrusion with a pyrite rich massive dacite to the north. The contact trends 300°. The dip was not apparent. The ultramafic intrusive rock is a massive peridotite. It is fine-grained, "chilled" near the contact with the dacite and becomes coarser grained to the south, away from the contact. Away from the contact, the peridotite did not show a magnetic attraction when tested with a pencil magnet. Moss Resources reported nickel values associated with sulphide mineralization in gabbro. The writer observed gossan only within felsic metavolcanic rocks and only in sample GWS-00-29, which was taken from right next to the contact, where a trace of very-fine-grained sulphide was observed in the peridotite. The sample was slightly magnetic, suggesting the sulphide may be pyrrhotite.

On the basis of the chilled contact, the writer interprets the peridotite to be intrusive to the felsic metavolcanic rocks. No other intrusive features were observed along the contact.

Moss Resources completed a fair amount of manual stripping on the showing. The majority of stripping was completed on exposures of the higher relief felsic metavolcanic rocks. Little stripping was observed on the peridotite.

Six grab samples collected in the vicinity of the Moss sample sites gave comparable analytical results for nickel. Platinum and palladium was not detected in the peridotite. The pyrite mineralization in the felsic metavolcanic rock yielded only background value for copper, zinc, lead and nickel.

Table 6. Analytical results for samples from the Moss – Tremblay nickel showing

Sample Number	Description	Pd ppb	Pt ppb	Cu Ppm	Ni ppm	Pb ppm	Zn ppm
GWS-00-19	Massive peridotite, fine- to medium-grained, no visible sulphide	N.D.	N.D.	45.23	1085.47	N.A.	N.A.
GWS-00-20	Contact phase of peridotitic intrusion, sample is light green-grey in color, medium-to coarse-grained, mostly plagioclase, no visible sulphide.	N.D.	N.D.	8.95	455.50	N.A.	N.A.
GWS-00-21	Massive peridotite, fine grained, no visible sulphide	N.A.	N.A.	13.01	1450.41	N.A.	N.A.
GWS-00-22	Int to Felsic volcanic, massive, 5% diss. Fine-grained pyrite.	N.A.	N.A.	23.43	52.14	1.93	59.08
GWS-00-23	Int to Felsic volcanic, massive, 5% diss. Fine-grained pyrite.	N.A.	N.A.	45.45	23.64	1.93	73.84
GWS-00-24	Massive Peridotite, fine-grained weakly magnetic, Trace VFG sulphide	N.D.	N.D.	23.27	971.92	N.A.	N.A.

N.D. = *Not Detected*
N.A. = *No Analysis*

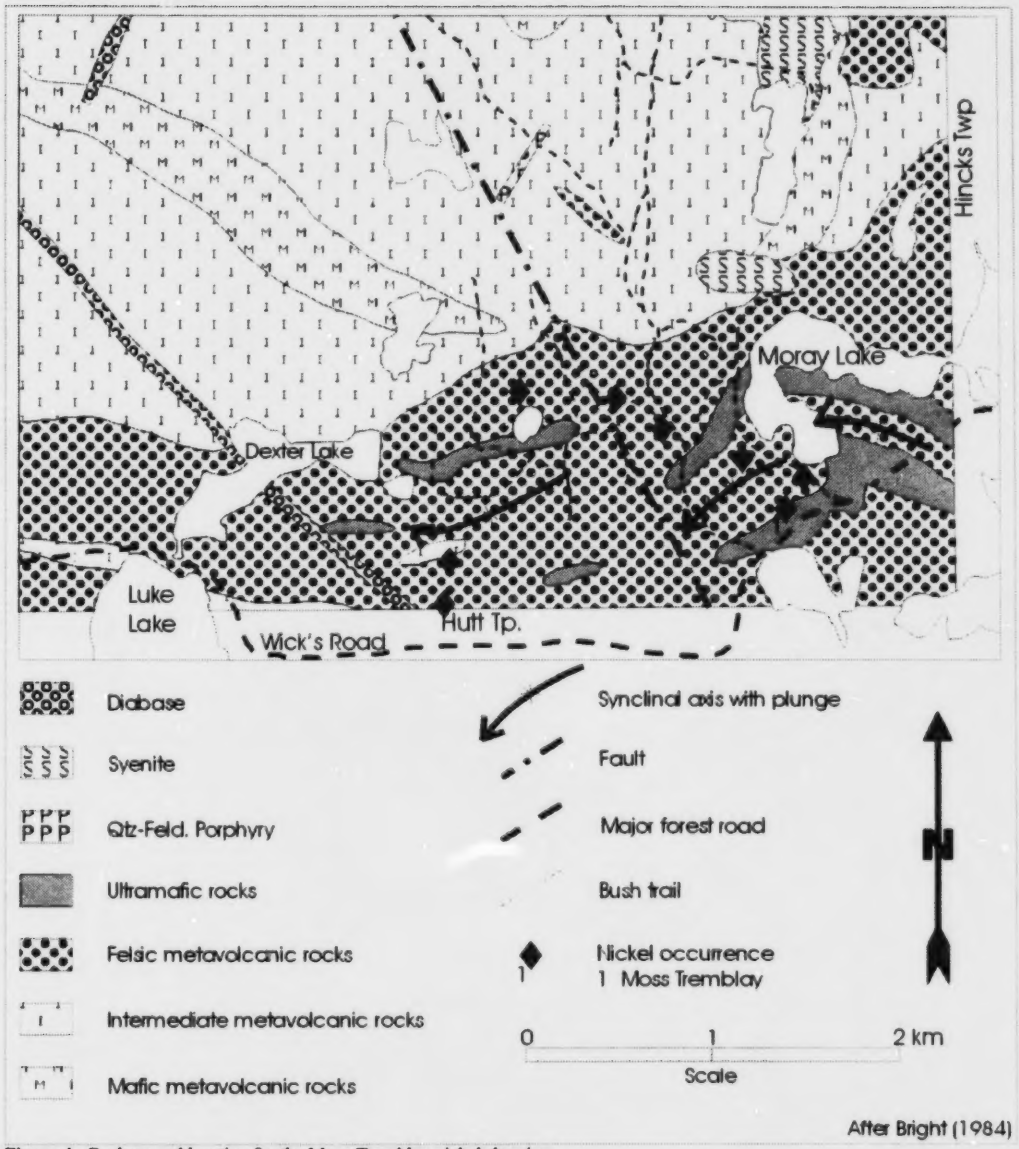

Figure 4. Geology and location for the Moss-Tremblay nickel showing.

DISCUSSION

The geological interpretation offered by E. B. Bright (1984) places the Moss – Tremblay nickel showing on the upper contact of the peridotite intrusion. The nickel sulphide mineralization may have resulted from contamination by the pyritic felsic metavolcanic rocks during the intrusive event. Also, the nickel content of the peridotite may be contained in the mafic silicate minerals. More detailed work is needed to make that determination.

Publications on komatiite-hosted nickel copper deposits typically describe heavier concentrations of nickeliferous sulphide near the base of ultramafic flows and intrusions [see Rogers et al., (1995) and references within]. Models for this deposit type require a source of sulphide for the sulphurization of komatiitic magma. Interaction of komatiitic magma with pyrite-rich felsic metavolcanic rocks could provide sulphurization resulting in sulphide deposition at the base of the intrusion. The Moss – Tremblay showing is interpreted to occur at the top of the peridotite intrusion. Future exploration should be targeted at the base of the intrusion.

That platinum and palladium were not detected in samples collected by the writer is not necessarily a negative indication. If heavier concentration of nickeliferous sulphide occur at the base of the peridotite intrusion, it is not unreasonable to expect that platinum and palladium present in the magma would have been scavenged and deposited near the base of the intrusion.

A compilation of past exploration work indicated 7 other nickel occurrences in the southeast corner of Zavitz Township.

The G.S.W. Bruce Road Showing

In 1990, the G.S.W. Bruce Prospecting Grubstake made a gold discovery in the northeast part of English Township. Luhta et al. (1991) reported the gold mineralization occurs within a 200 m wide, northeast-striking, sheared, altered zone that is strongly ankeritized [*sic*], and contains geochemically anomalous gold across most of its width. The Road showing yielded values up to 3.5 g/t gold over 1.0 m. The Ontario Prospectors Assistance Program supported this discovery.

Tintina Mines Ltd. optioned the property and in 1991, completed geological mapping, geophysical surveys, extensive trenching, channel sampling and 3 diamond-drill holes. The drilling indicated the syenite sill containing the Road Showing was cut off at 30m below surface.

LOCATION AND ACCESS

The G.S.W. Bruce Road showing (Figure 5) is located at UTM co-ordinates (NAD 27) Zone 17, 483825N 5323909N in northeast English Township. Access to the showing, from Timmins, is via the Stringer forest access road system leading south from Tisdale Street in South Porcupine. The 1st right after distance marker 59 (km) is known as the Ferrier Creek road. The Ferrier Creek road branches north and south about 1 km west of the Stringer Road. The south branch leads to the showing area.

GEOLOGY

E. B. Bright (1984) mapped the geology of the Ferrier Lake–Canoeshed Lake area that includes English Township. He documented that felsic metavolcanic rocks underlie most (80%) of the township. However, outcrop density was low, owing to the glacial cover, and where outcrops were found, the geology was more complex. Mapping near the occurrence found gabbro sills intruding felsic metavolcanic rocks. The gabbro sills make up about 50% of the exposed bedrock.

Mapping by Kerr (1990) reported the majority of exposures near the occurrence were massive mafic metavolcanic rocks, with locally dominant tuffaceous horizons. In one area of trenching, the writer observed strongly deformed pillow structures. Kerr (1990) reported intermediate metavolcanic rocks near a northeast trending diabase dike mapped by Bright (1984). Kerr (1990) also reported that felsic metavolcanic rocks were rare in the general area, but were more prevalent near the Road Showing. Small intrusions of diorite, feldspar porphyry, quartz porphyry, quartz-feldspar porphyry, felsite, and syenite intrude the metavolcanic rocks. The highest gold concentrations occur in felsic intrusions.

Kerr (1990) reported the Road showing "is part of a much larger alteration zone in which individual outcrops are completely altered by a combination of ankeritic carbonatization, pervasive calcite, pyritization, sericitization, and local shearing." This alteration zone trends northeast.

Sabag and Kerr (1991) concluded the Road showing and the associated northeast trending alteration zone occur within Tisdale assemblage rocks whereas the felsic metavolcanic rocks mapped by Bright (1984) are part of the Deloro Assemblage. Further, Sabag and Kerr (1991) mapped a northwest trending fault to the west of the Road showing as the contact between the Tisdale and Deloro assemblage rocks.

Sabag and Kerr (1991) also found several other small syenite sills and dikes on the property. The syenites are consistently anomalous in gold.

OBSERVATIONS

The G. S. W. Bruce Road showing consists of quartz veining contained within a Fe-carbonitized syenite intrusion. The syenite occurs in a several hundred metre wide shear zone that trends 025° to 060°. Cross-cutting quartz veins, 0.5 to 5 cm wide comprise up to 10% of the syenite. There are at least 2 ages of veins; a 060° set cuts a 335° set. Pyrite is associated with the quartz veining, and variable concentrations are disseminated through the syenite. Magnetite-filled fractures are located throughout the outcrop. Examination of the geology in relation to past assay results did not reveal a direct association between quartz or sulphide content and gold tenure.

Previous work extensively channel sampled the G. S. W. Bruce Road showing outcrop. The writer took selected grab samples of specific vein sets and alteration types as well as a duplicate of a 2057 ppb Au Tintina grab sample; samples numbers GWS-00-27 to GWS-00-32. The results, given in Table 7, lead the writer to conclude that gold is most associated with pyrite and possibly the 335° vein set. The low value reported from the duplicate Tintina sample (GWS-00-31) suggests an erratic distribution of gold.

Table 7. Analytical results for samples from the G.S.W. Bruce road showing

Sample Id.	Description	Au ppb
G. S. W. Bruce Road Showing		
GWS-00-27	Brick Red syenite, Fine Grained, Fine Diss Py <1%, 2 cm 335° quartz vein	1521.88
GWS-00-28	F.G. Brick Red Syenite, Tr. Py, Magnetite Lined Fracture	114.98
GWS-00-29	F.G. Brick Red Syenite with cross cutting quartz veins. 3% diss Py	261.12
GWS-00-30	F.G. Brick Red Syenite with 5% diss Py	476.65
GWS-00-31	Qtz veined, Pyrite Rich syenite from location of GW Bruce 2 gram sample 5% py	230.45
GWS-00-32	F.G. Brick Red Syenite with No magnetite lined fractures, no quartz veining, but containing 3 – 5% fine diss py +/- cp	985.90
North Zone		
GWS-00-33	Felsite between GW Bruce Samples 134 and 129	86.24
GWS-00-34	Felsite duplicate of GW Bruce 138	52.05
GWS-00-35	Felsite, from south end of Bruce north Showing Outcrop	22.49

About 100 m north of the Road Showing at UTM 483848E 5324008N is a shear-parallel 3m wide felsite dike. This is known as the North Zone. Previous sampling indicated that the south side of the dike consistently carries between 1 and 2 g/t Au with no visible sulphide or large quartz veins. The rock has a dominant fracture at 350°/80°E with some fractures filled with 1 - 5 mm quartz veinlets. Grab samples GWS-00-33 through GWS-00-35 were taken from the dike. The low, but anomalous gold values suggest an erratic gold distribution.

The host rocks to these occurrences are pillowed and massive mafic metavolcainc flows. A 200 m-wide Fe-carbonate alteration zone containing the showings trends northeastly through the metavolcanic flows. Both the intensity of the alteration and the degree of shearing is variable within the mineralized zone.

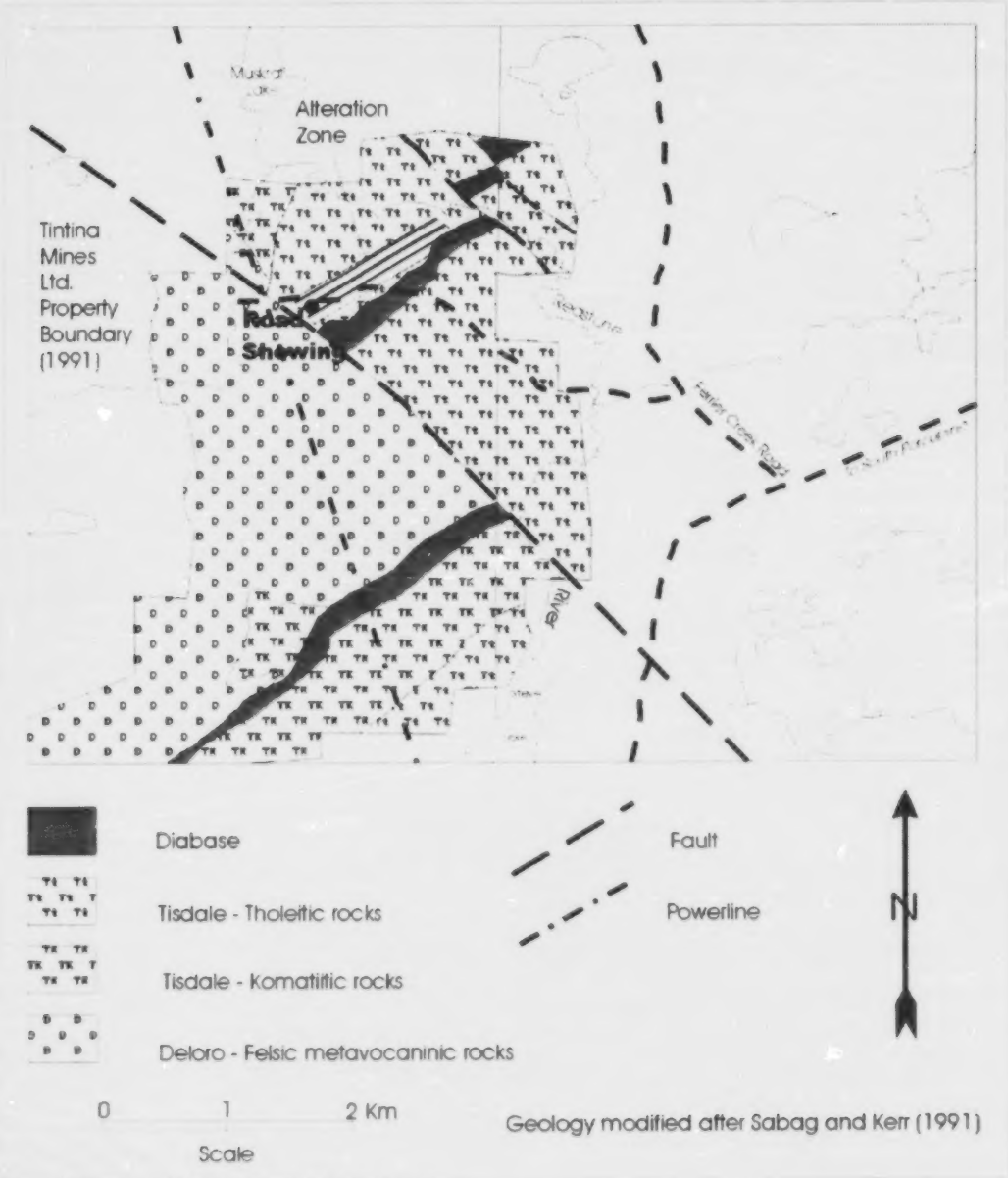

Figure 5. Geology and location of the G.S.W. Road showing.

Lowther Township Rare Metal Pegmatite

The Lowther Township rare metal pegmatite is located in the southeast part of Lowther Township on Lot 7, Concession IV, (north half) approximately 23 km south of Hearst. The pegmatite is identified as a lithium occurrence on the regional geology map and is presently staked as unpatented mineral claim 1241384 held by R. Lecours. Access to the occurrence is by way of Hwy 583 south from Hearst, for 25 km, then eastward on Lowther concession road 8 and 9 for 2 km, then south on a branch road that ends at a gravel pit. Beyond the gravel pit, a bush trail leads southeast for about 9 km to the occurrence. The trail crosses two branches of Cockoo Creek, the first creek is 50 m wide at the trail intersection where it has been dammed by beavers, and is impassable by all-terrain vehicles. The second creek is narrow but deep.

Previous work on the property includes minor trenching and diamond drilling of 3 holes totalling 89 feet by I. Topaloff in 1957. Magnetic and electromagnetic (VLF-EM) surveys were done by Noranda Exploration Co. Ltd. in 1978. Hewitt (1967) reported the pegmatite as a granite pegmatite with spodumene and lepidolite. Smith et al. (1999) classified the Lowther Township pegmatite as an albite + spodumene rare metal type pegmatite. The property is situated in the Quetico metasedimentary subprovince.

Outcrops on the property form low mounds that expose a zoned albite + spodumene pegmatite dike hosted in medium grained quartz monzonite. The dike trends 150^0 and has dimensions of 28 m by 30 m strike exposure. The country rock hosting the dike consists of a clotty amphibole-bearing quartz monzonite on the northwest side and a biotite granodiorite on the southeast. The dike consists of three phases including a 20 m wide east zone of graphic textured quartz and microcline, (Figure 6) a 3 m wide central zone of coarse grained exotic mineral suite pegmatite and a 5m wide west zone consisting of fine grained, colourless to grey quartz and pale green muscovite occurring as mineral plates up to 15 cm in size (Figure7).

Spodumene occurs as ½ centimetre sized white crystals intergrown with white feldspar, light grey quartz, green muscovite, medium-grained, anhedral salmon coloured spessartine (positive XRD identification by Geoscience Laboratories Section) and a rare, unidentified non-magnetic black metallic mineral in the central zone of the dike. Garnet and tourmaline occur as accessory minerals. Ferguson (1955) reported lepidolite occurs in veins measuring four inches in width and up to ten feet in length, associated with quartz veining, but such veins weren't observed during the present property examination.

Geochemical analysis of rock samples from the three zones of the pegmatite are provided in Table 8. Elevated lithium, (8370 ppm) and high Rb/Sr ratios are consistent with an evolved rare metal type origin for the Lowther Township pegmatite.

Figure 6. Graphic intergrowth of quartz and feldspar, Lowther Township rare metal pegmatite. Pencil is 19 cm long.

Figure 7. Coarse grained muscovite and quartz, west zone, Lowther Township rare metal pegmatite. Hammer is 32 cm long.

Table 8. Analytical results for samples from the Lowther Township rare metal pegmatite

Element (ppm)	Sample number		
ICP analysis	2000 BTA 53 central zone exotic pegmatite	2000 BTA 54 west zone quartz+muscovite	2000 BTA 55 east zone quartz+albite
Al	108948	22151.90	16416.10
Ba	9.42	-	-
Be	4.60	2.33	3.34
Ca	875.32	161.16	285.65
Cd	-	-	-
Co	-	-	-
Cr	4.25	3.93	4.28
Cu	2.22	-	-
Fe	8408.34	3787.60	872.83
Ga	105.57	21.19	6.72
Hg	nm	nm	nm
Li	8370	710.15	48.34
Mg	301.90	153.75	193.53
Mn	660.62	858.34	203.27
Mo	-	-	-
Ni	-	-	-
Pb	4.63	0.65	0.68
Sb	-	-	-
Sc	1.52	-	0.74
Sn	50.58	22.16	0.71
Ti	178.87	56.82	11.08
Tl	10.13	4.25	-
V	14.26	3.09	3.60
W	0.54	0.36	-
Zn	103.13	171.72	5.52
Ce	1.624	-	0.315
Cs	152.028	57.752	4.840
Dy	-	-	-
Er	-	-	-
Eu	-	-	-
Gd	-	-	-
Hf	1.78	0.26	0.22
Ho	-	-	-
La	0.594	-	-
Lu	-	-	-
Nb	137.95	21.23	7.46
Nd	0.67	-	-
Pr	-	-	-
Rb	>400	383.73	28.33
Sm	-	-	-
Sr	11.8	3.2	3.3
Ta	58.98	7.77	5.65
Tb	-	-	-
Th	-	-	-
Tm	-	-	-
U	1.053	0.188	0.825
Y	0.28	0.18	0.62
Yb	-	-	-
Zr	10.87	3.36	3.92

\- *not detected*
nm *not measured*

Mann Intrusion - Mann Township

The Mann intrusion is a poorly exposed, complexly zoned, mafic to ultramafic intrusion that extends northwest from Iroquois Falls through Calvert, Aurora, McCart, Newmarket, Mann, Hanna, Duff and Reaume Townships. It forms a ragged ellipsoid shaped body with maximum dimensions of 40 km by 4 km wide that has been folded along northwest trending fold axes. Detailed geochemical and petrographic descriptions of the Mann intrusion are provided by Good et. al. (1997). Barrie and Corfu (1999) obtained an age date of 2706 Ma for the Mann intrusion. Miller (1914) made the first reported occurrence of in situ Ontario diamonds from ultramafic rocks in Reaume Township in what may be part of the Mann Intrusion. Besides the report of microscopic diamonds, the rocks assayed 13.44 % CrO_2, 14.58 % Fe and 0.066 ounce per ton Pt. The assayed sample contained serpentine, presumably after olivine phenocrysts. Chrysotile asbestos occurs as veinlets at the sample site, and nickeliferous pyrrhotite is reported.

East West Resources Ltd. and Tres-Or Resources Ltd. separately hold blocks of claims covering part of the Mann intrusion. East West Resources' property consists of 35 claim units. The Tres-Or Resources Ltd.'s property includes 19 claims covering 304 hectares adjoining the East West Resources property to the south. Access to the area is by a gravel concession road that leads west from Highway 11, approximately 22 km north of Iroquois Falls to a bridge that spans Frederick House River.

The area has had a limited amount of past exploration work by several major companies and individuals exploring for base metals. The most concerted work was completed between 1947 to 1950 when P. B. Zevely carried out magnetic surveys and diamond drilled 28 holes amounting to 20 000 feet. Most of that drilling concentrated on the peridotite-gabbro contact depicted in Figure 8. Mineralization reported in the drill logs includes chalcopyrite, pyrite, pyrrhotite and pentlandite.

An examination of rocks exposed in outcrop along the Frederick House River in Mann Township reveal ultramafic rocks that are serpentinized and asbestos bearing. The composition of the rocks vary from pyroxenite to peridotite that are variably magnetic and carbonate altered. Limited sampling and diamond drilling has returned assays with platinum+palladium values up to 1.1 ppm (Good and Crocket, 1999). These rocks occur at the hinge of a fold that produced a local north-trending orientation to the rocks. Southward, the rocks are in contact with felsic volcanic rocks of the Stoughton-Roquemaure assemblage. The geological contact is exposed in river outcrops ½ km south of the bridge. Several samples of peridotite were collected for analysis and the results are presented in Table 9.

Table 9. Analytical results for samples collected from riverside outcrops in the vicinity of the Zevely drilling .

Sample Number	Au ppb	Pt ppb	Pd ppb	Cu ppm	Ni ppm	Description
2000 BTA 01	5.2	36.8	23.9	11006	1167	asbestos bearing peridotite
2000 BTA 02	2.7	2.7	0.6	12	2348	asbestos bearing peridotite
2000 BTA 03	2.0	4.1	11.6	62	3499	serpentinized peridotite

The very limited amount of sampling confirms the anomalous PGE character of the rocks and suggests PGE values correlate with elevated copper values. The anomalous nickel content of the rocks as indicated by the recent sampling and as reported by Hogg (1950), suggests the possibility of nickel mineralization where the original magma has encountered a sulphur source.

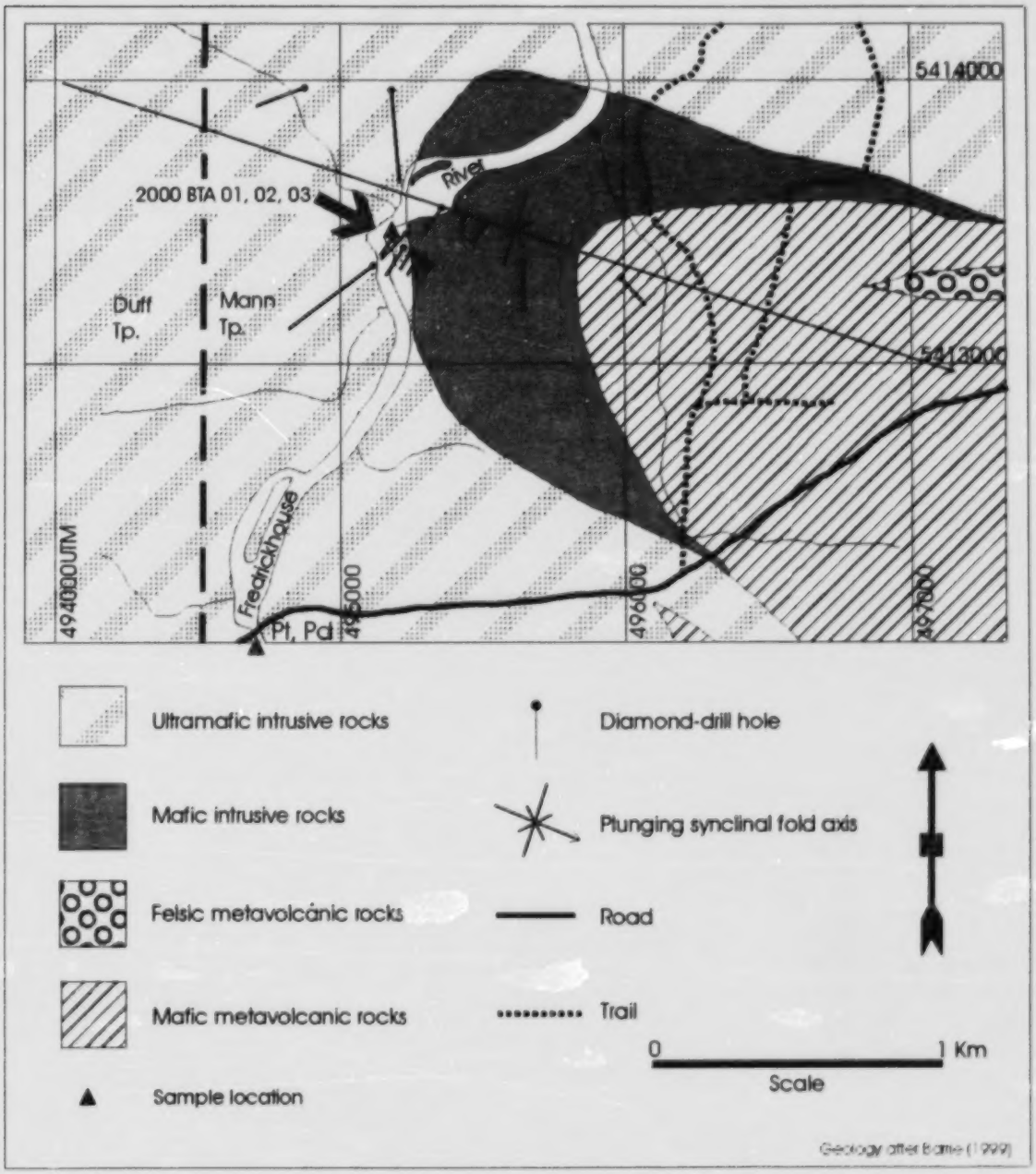

Figure 8. Geology of the Mann intrusion in the vicinity of the Frederick House River (modified from Barrie, 1999).

RECOMMENDATIONS FOR EXPLORATION

Halliday Dome

The Halliday Dome, (Figure 9) bounded by English and Zavitz Townships on the north, and Kemp and Mond Townships on the south has witnessed a long and varied exploration history. Early work concentrated on gold mineralization as the area was thought to contain the western extension of the Cadillac-Larder Lake Break. Certainly, the presence of Temiskaming-type metasedimentary rocks, gold mineralization associated with "green-carbonate rock" and small syenite stocks supported this theory. Later, the copper-nickel potential of some of the ultramafic rocks was recognized, which led to the 1950 discovery of the Sothman deposit by Dominion Gulf Company. This deposit is the subject of current exploration by Hucamp Mines Ltd. who are attempting to expand upon the 190,000 tons (1.24% Ni) resource, and also examine the unknown Platinum Group Element potential.

By the late 1960's, the potential of the area to host volcanogenic massive sulphides (VMS) deposits was recognized, resulting in the discovery of a number of base metal showings and prospects. Recent work on this front has recognized that at least some to the felsic metavolcanic rock are Type F3b, high silica rhyolite with geochemistry similar to those hosting the Kidd Creek Mine and the VMS deposits of the Noranda camp. VMS exploration in the Halliday Dome is ongoing.

Compilation of mineral occurrences and fieldwork around the Halliday Dome during the past year has led to the following observations and recommendations:

1) The Halliday Dome contains numerous ultramafic bodies, these are both extrusive and intrusive in nature. Several copper-nickel occurrences have been discovered by past exploration. Most are sub-economic grade, underexplored and never assayed for PGE mineralization. Essex Minerals discovered a notable example of such mineralization in 1978. Several samples sent for whole rock analysis returned nickel values between 0.07% and 0.55%. Generally, nickel values over 0.25% indicate that there is more nickel than what is present in silicate minerals. Unfortunately, the assessment file that contains these analyses does not give the sample locations other than they are from the NE corner of Sothman Township. Interestingly, the intrusion that hosts the Sothman deposit is comparable in size to many others scattered around the Halliday Dome. Given the current interest in PGE mineralization, further examination of ultramafic bodies within the Halliday Dome is warranted.

2) VMS exploration around the Halliday Dome resulted in the discovery many base metal sulphide occurrences associated with graphitic argillites. In some cases these sulphides were rich enough in zinc and copper to yield sub-economic grades. In most cases, these discoveries were made as the result of airborne geophysical survey target investigation and diamond drilling. Most base metal sulphide occurrences have had little or no follow-up work. Given that sulphide-rich graphitic argillites are associated with VMS deposits like the Kidd Creek Mine and that there can be rapid facies changes in volcanic environments, the zinc- and copper-rich graphitic argillites of the Halliday Dome area deserve another look. More advanced geophysical and geochemical methods may reveal new targets around the "already-tested" ones.

3) There are many documented shear zones and green-carbonate alteration zones around the Halliday Dome, yet most have not been correlated to any large-scale structure such as the Cadillac-Larder Lake Break. A compilation of shear zones, gold occurrences, green carbonate alteration and syenite intrusions coupled with the re-interpretation of regional geophysical surveys may reveal a pattern that could lead to the discovery of gold mineralization associated with one or more regional structures.

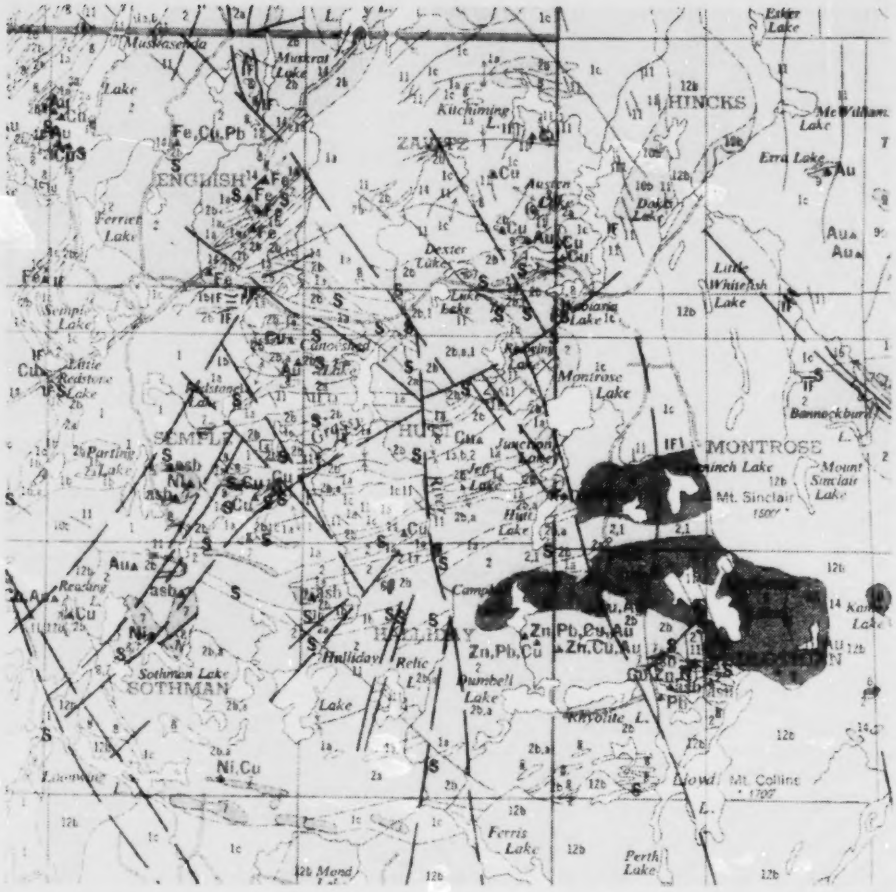

Figure 9. General geology of the Halliday Dome, from Map 2205, (Pyke, Ayers and Innes 1972).

Rare Metal Pegmatites

Recent investigations of rare metal pegmatites recognize the importance of S-type granites in evolving fertile pegmatites having the potential of hosting rare metals (eg. Breaks et al, 1999). The Lowther Township pegmatite (*see* Property Examinations section) is an example of a rare metal pegmatite within the Quetico subprovince. These dikes usually occur in swarms and the presence of the Lowther Township pegmatite indicates the Quetico subprovince, in the vicinity of the Kapuskasing structural zone is a favourable area for rare metal pegmatite exploration. Additional information on the chemistry and mineralogy of rare metal pegmatites that may assist in their discovery is provided in Breaks and Trindle (1997).

Rare metal pegmatites are relatively easy to identify in the field. The very course grain size, the predominance of muscovite over biotite, an overall white colour to the dikes and the presence of unusual mineral species are typical characteristics. New technological applications and increasing rare metal prices make these pegmatites attractive exploration targets. Proximity to road or rail is an important consideration when exploring for rare metal pegmatites as transportation costs are a major criteria for their development.

Platinum Group Elements (PGE), Magmatic Ni-Cu Sulphides

KAMISKOTIA AND MONTCALM GABBROIC COMPLEXES AND THE SHAWMERE ANORTHOSITE COMPLEX

The Kenogamissi Batholith separates two large mafic to ultramafic intrusive complexes, the Montcalm gabbroic complex and the Kamiskotia gabbroic complex, depicted in Figure 10. Barrie (1990, 2000) suggests these bodies are non-PGE bearing for the following reasons:

a) Reconnaissance sampling of 52 pegmatitic dikes from the Kamiskotia complex were barren of PGE.
b) Geochemistry of the gabbros is dissimilar to known PGE enriched gabbros.
c) Sulphide mineralization in the Montcalm nickel copper deposit within the Montcalm gabbroic complex is PGE depleted while those in the Kamiskotia gabbroic complex are very low in copper nickel and PGE content.
d) Stratiform horizons of pegmatitic gabbro are absent.

Nonetheless, the two intrusions are very extensive and form two of the largest bodies of mafic intrusive rocks in the Ontario part of the Abitibi subprovince. These two bodies have similar ages, suggesting possible derivation from a single magma chamber. When reassembled prior to the intrusion of the Kenogamissi batholith, (Figure 11) the bodies present a compelling target for PGE mineralization associated with a large, zoned mafic magma chamber. Economic concentrations of PGE and Ni-Cu magmatic sulphides may lie hidden beneath the extensive glacial cover that blankets much of the Kamiskotia and Montcalm gabbroic complexes.

Gabbroic rocks in Loveland Township have been recently discovered to be PGE enriched. If these rocks were derived from the same magma chamber that produced the nearby Kamiskotia gabbroic complex, this provides direct evidence that the original magma was PGE-bearing and suggests economic deposits of PGE mineralization may be present.

At the Lac des Iles Mine, located 100 km north of Thunder Bay, Ontario, some of the PGE ore is completely devoid of sulphides (M. Lavigne, North American Palladium Ltd., personal communication, 2000). This is an important consideration when exploring for PGE mineralization and underscores the necessity for extensive sampling in favourable PGE environments. The Kamiskotia and Montcalm gabbroic complexes present two such favourable environments.

The proximity of the Shawmere anorthosite complex, located 30 km to the southwest of the Montcalm gabbroic complex adds further interest to the area. The Shawmere anorthosite complex is almost equal in area to the Sudbury basin. The Montcalm and Kamiskotia gabbroic complexes may be more primitive phases of magma crystallization while the Shawmere anorthosite represents an earlier product of crystal fractionation and differentiation. A combination of tectonic displacement and batholithic expansion could account for the present distribution of these once juxtaposed bodies. In such a scenario, the Montcalm and the Kamiskotia gabbroic complexes could preferentially concentrate PGE. The complex magmatic history of the intrusions is evidenced by multiple phases of intrusions, magma mixing, layering and cross bedding features within them.

Easton (2000) indicated mid-crustal panels of mafic to ultramafic rocks may have a role in controlling platinum group element mineralization at the East Bull Lake Intrusion in the Sudbury District. Thurston (2000, p 2-7), suggests similar panels of rocks with PGE potential may be present in the Kapuskasing structural zone. Collectively, the Kamiskotia and Montcalm gabbroic complexes and the Shawmere anorthosite complex provide vast underexplored settings for PGE mineralizatien.

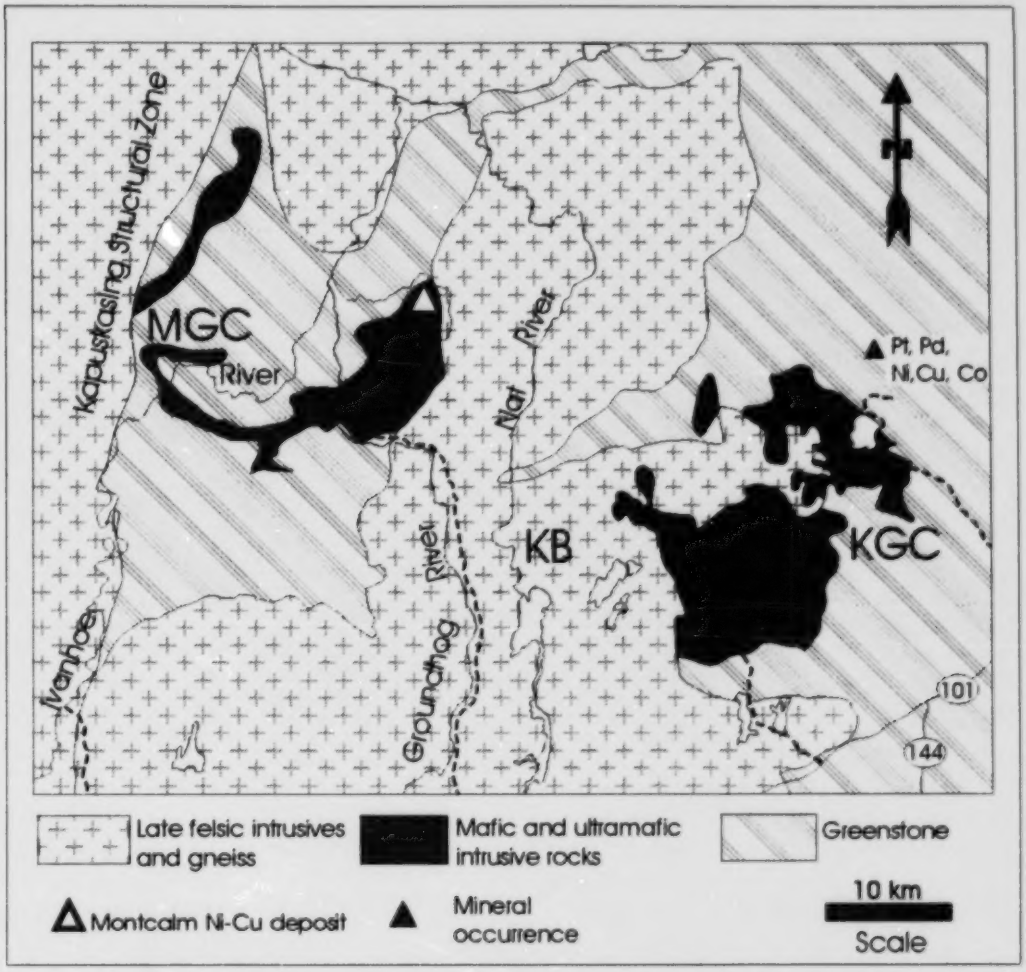

Figure 10. Geology of the Montcalm - Kamiskotia area .
The Montcalm gabbroic complex (MGC) and the Kamiskotia gabbroic complex (KGC) are shown in their present configuration on either side of the Kenogamissi batholith (KB). Their age similarities, 2702±2 Ma, MGC, and 2707±2Ma, KGC, indicate a contemporaneous origin for these intrusions. Subsequent emplacement of the Kenogamissi batholith (2696±1.5 Ma) post-dates the MGC and the KGC. (Geochronological age dates from Barrie and Naldrett, 1990, and Barrie, 2000).

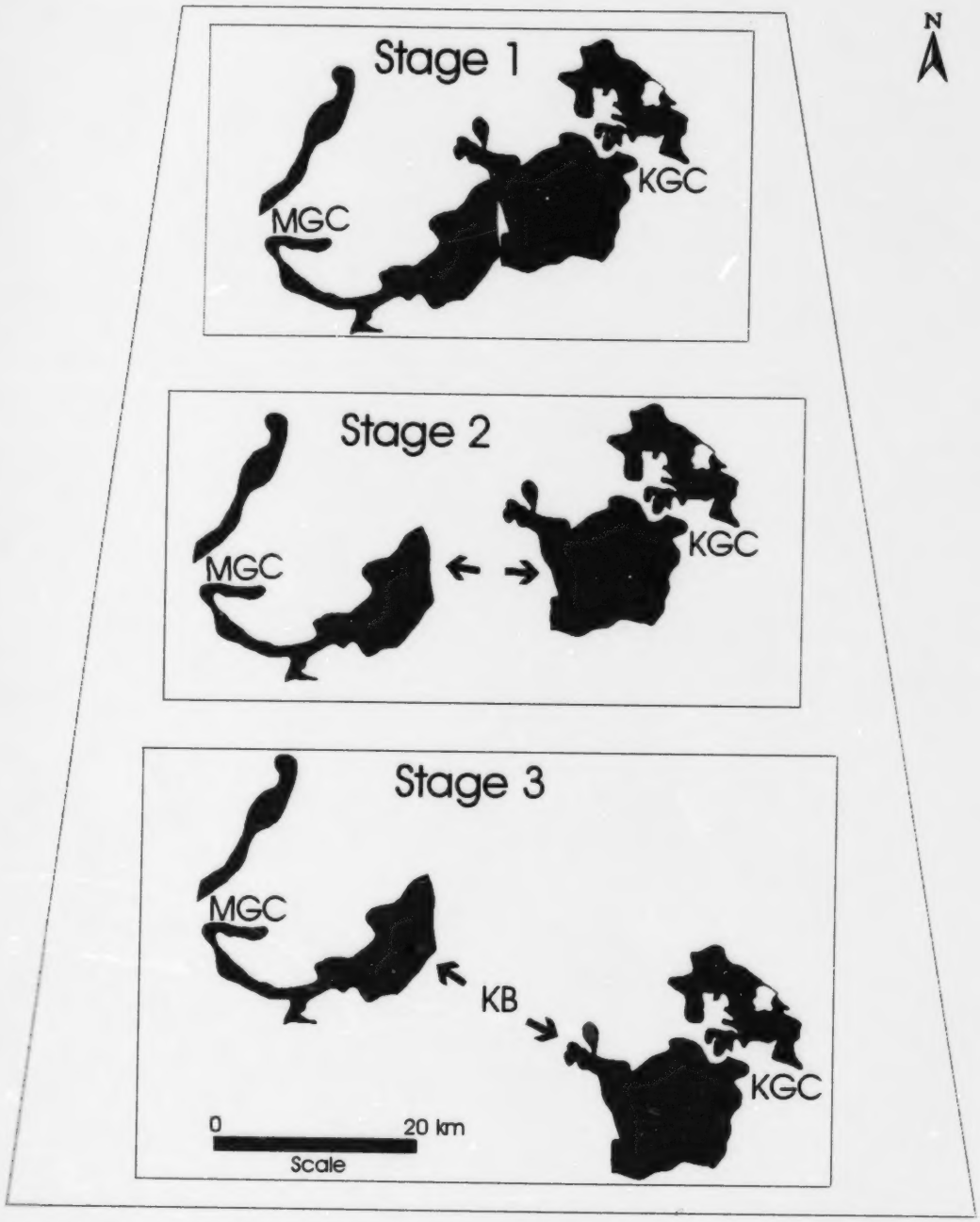

Figure 11. Progressive stages of displacement of the Montcalm gabbroic complex (MGC) and the Kamiskotia gabbroic complex (KGC) as a result of the emplacement of the Kenogamissi batholith (KB).
Stage 1 is prior to batholithic emplacement with the formation of the MGC and the KGC from a single magma chamber. Stage 2 represents the initial stages of batholithic emplacement and Stage 3 is the present configuration of the intrusive bodies.

OGS ACTIVITIES AND RESEARCH BY OTHERS

A number of mapping and research projects were underway or completed in the Timmins District and are listed below. Details of the projects are reported in Summary of Field Work and Other Activities (Ayer et. al, 2000).

J. Becker and K. Benn (Ottawa – Carleton University) did a structural study of the Kenogamissi batholith and enclosing greenstone rocks.

Under the NATMAP initiative of the Geological Survey of Canada, B. Berdusco and G. Stott (Ontario Geological Survey, Precambrian Section) did a reintrepretation of airborne magnetic data previously flown over the James Bay and Hudson Bay lowlands in the north part of the Province. The project aimed to understand the Precambrian geology underlying the Phanerozoic sedimentary rocks of the lowlands.

E. Dinel (University of Ottawa) did structural investigations in central Ogden Township

S. Deschamps (McMaster University) carried out a B. Sc. study to determine the physical properties of lithologies in the Matheson and Kirkland Lake areas. The area of investigation coincided with recent airborne geophysical surveys and was in part oriented to assist in the interpretation of airborne surveys.

M. Houle (Laurentian University) examined the volcanology and metallogenesis of komatiites in the Kidd – Munro Assemblage of the Abitibi subprovince as a Ph.D. study.

K. R. Scully (University of Toronto) completed an M.Sc. thesis entitled "Mantle xenoliths from Attawapiskat kimberlite field, James Bay Lowlands, Ontario."

R. Sproule (Laurentian University) studied variations in the geochemistry of komatiites in the Abitibi subprovince.

C. Vaillancourt (Ontario Geological Survey, Precambrian Section) completed 1:20 000 scale geological mapping and compilation of Ogden and Bristol townships.

Operation Treasure Hunt

Operation Treasure Hunt is a three year initiative funded through the Ontario Ministry of Northern Development and Mines with the objective of enhancing the geoscience database of the Province. A number of projects funded through this initiative include the following in the Timmins District:

Airborne geophysical surveys were flown over the Cochrane area, the Matheson area and the Kirkland Lake area. The Kirkland Lake survey overlapped with the Timmins District. A geophysical test site was established in Reid and Mahaffy townships and various airborne geophysical systems were flown over the site to test and compare different instrument responses.

Lake sediment surveys were completed in the Foleyet to Missinabi area. Archived lake sediment samples from the Peterlong Radisson area were analysed for their platinum group element content.

Approximately 2000 modern alluvium samples were collected over an area of 65 000 km^2 covering the Kapuskasing structural zone and analysed for indicator minerals associated with kimberlite, magmatic massive sulphides and gold mineralization.

Existing proprietary airborne survey data were purchased from a number of industry sources to supplement existing government airborne surveys. Purchases included surveys by Spider Resources Inc. in the James Bay Lowlands and Falconbridge Limited data in the vicinity of Frederick House Lake in Gowan, Evelyn and Dundonald townships.

ACKNOWLEDGEMENTS

Information on past activities reported in the text are from assessment files and other files of the Timmins Resident Geologist Office unless otherwise noted. Information on current mining and exploration activities has been kindly provided by the companies involved.

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Table 10. Assessment files received for the Timmins District in 2000.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARES ..... Airborne resistivity survey
Beep ..... Beep Mat Survey
Bulk ..... Bulk sampling
Comp ..... Compilation
DD ..... Diamond drilling
DGP ..... Down-hole geophysics
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GPS ..... Global Positioning System
Grav ..... Gravity survey
GT ..... Geotechnical survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
MM ..... Mise à la masse
ODH ..... Overburden drill hole(s)
OM ..... Ontario Mineral Incentive Program
OP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
Pet ..... Petrography
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Str ..... Stripping
TEM ..... Transient electromagnetic survey
TM ..... Thermal maturity
Tr ..... Trenching
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Adams et al. (5 townships)	Timmins Nickel, Inc.	1992	Assays, DD - 25 - 14 513ft, DGP, GC, GEM, GM, Lc, Met, ODH, PEM, TEM	OM92-019	T-4473
Adanac, Homuth	Pegg, C.C.	2000	AEM, AM, ARES	2.20168	T-4353
Allenby et al. (13 townships)	Kennecott Canada Exploration	1997-1999	AEM, AM, HM, GL	2.19770	T-4412
Auden, Fintry	McGale, J.	1954-1968	Assays, DD - 3 - 761ft, GL, GM	Donation	T-351
Beemer	Starfire Minerals Inc.	1999	Assays, DD - 2 - 484m	2.20296	T-4390
Benton	Lashbrook, R.L.	1999-2000	Assays, GC, GL, Lc	2.20484	T-4457
Benton, Garnet	Lashbrook, R.L.	1998	Assays, GM, Lc, Pr, Samp, Str, VLFEM	OP98-292	T-4379
Benton et al. (4 townships)	Archibald, G.M.	1998	Assays, GL, Pr, Samp	OP98-401	T-4375
BMA 527 834	Monopros Limited	2000	DD - 6 - 1862m, GT	2.20497	T-4449
Bourinot	Dia Bras Exploration Inc.	2000	GM, Lc	2.20156	T-4346
Bourinot	Dia Bras Exploration Inc.	2000	GM, HLEM	2.20157	T-4347
Bourinot	Dia Bras Exploration Inc.	2000	AEM, AM, ARES	2.20159	T-4348
Bourinot	Dia Bras Exploration Inc.	2000	DD - 3 - 302m	2.20158	T-4426
Bradley	Hopkins Exploration Consultants	1955	GL	Donation	T-4361
Bristol	Aube, A.	1999-2000	GM, Lc	2.20042	T-4332
Bristol	Cameco Corporation	1999-2000	GM, GPS, Lc	2.20146	T-4344
Bristol	Explorers Alliance Corporation	1999	GM, HLEM, Lc	2.20044	T-4334

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Bristol	Explorers Alliance Corporation	2000	Assays, DD - 2- 555m	2.20148	T-4345
Bristol	Laforest, D.	2000	GM, Lc, VLFEM	2.20702	T-4491
Bristol	Prospectors Alliance Corporation	1999	Assays, DD - 1 - 180m	2.20471	T-4440
Bristol	Prospectors Alliance Corporation	1997	Assays, DD - 3 - 413m	2.20637	T-4481
Bristol, Godfrey	Explorers Alliance Corporation	2000	GM, HLEM, Lc	2.20328	T-4405
Bristol, Godfrey	Explorers Alliance Corporation	2000	DD - 1 - 402m	2.20603	T-4460
Brower	Haire, P.G.	1998-1999	GL, Lc	2.19876	T-4314
Brower	Haire, P.G.	2000	Assays, GC	2.20438	T-4441
Byers, Côté	Explorers Alliance Corporation	2000	DD - 1 - 156m	2.20230	T-4373
Byng	Lecours, R.M.	1998-2000	Assays, GL, Pr, Samp, Str, Tr	2.19723	T-4315
Byng	Lecours, R.M.	2000	GM, HLEM, Lc	2.20567	T-4466
Caithness, Doherty	Leblanc, A.J.	1998	Assays, GM, Pr, Samp, VLFEM	OP98-272	T-4381
Cargill	Viridian Inc.	2000	DD - 29 - 2483m	2.20527	T-4454
Cargill, Ecclestone	Berland Resources Ltd.	1999	AEM, AM, ARES	2.20171	T-4356
Cargill, Ecclestone	Silverman, G.C.	2000	GM, Lc, VLFEM	2.20582	T-4459
Cargill, Ecclestone	Silverman, G.C.	2000	Assays, GC	2.20583	T-4465
Carnegie	Falconbridge Limited	1999	DD - 1 - 120m	2.19962	T-4318
Carnegie	Falconbridge Limited	1999	Assays, DD - 2 - 538m	2.20126	T-4343
Carnegie	Falconbridge Limited	1998	DD - 1 - 250m	2.20294	T-4389
Carnegie	Falconbridge Limited	1999	Assays, DD - 1 - 239m, DGP	2.20329	T-4406
Carnegie et al. (6 townships)	McIntyre Porcupine Mines	1969-1970	GL	Donation	T-4472
Carscallen	Explorers Alliance Corporation	2000	IP, Lc	2.20394	T-4415
Carscallen	Falconbridge Limited	1999	GM, HLEM, Lc	2.19944	T-4313
Carscallen	Falconbridge Limited	2000	DD - 1 - 372m	2.20633	T-4480
Carty	Perello, M.V.	1999	Assays, DD - 1 - 167m	2.20295	T-4397
Carty, Lemoine, Warren	Perello, M.V.	1998-1999	AEM, AM	2.20289	T-4450
Casselman	Falconbridge Limited	1998	GM, HLEM, Lc	2.20012	T-4323
Casselman	Falconbridge Limited	1998	GM, HLEM, Lc	2.20013	T-4324
Casselman	Falconbridge Limited	1998	GM, HLEM, Lc	2.20015	T-4326
Casselman	Hinzer, J.	2000	HM	2.20464	T-4439
Casselman et al. (4	Falconbridge Limited	1998-	Beep, GL	2.20016	T-4327

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Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
townships)		2000			
Casselman et al. (4 townships)	Falconbridge Limited	1999-2000	GM, HLEM, Lc	2.20188	T-4367
Casselman, Nansen	Falconbridge Limited	1998	GM, HLEM, Lc	2.20014	T-4325
Casselman, Staples	Falconbridge Limited	1998	GM, HLEM, Lc	2.20017	T-4328
Casselman, Swanson	Hinzer, J.	1998-2000	HM, GM, Pr, Samp	2.20103	T-4340
Clay, Howells	Algoma Ore Properties, Limited	1954-1955	AM, Assays, Comp	Donation	T-4410
Clergue	Nufort Resources Inc.	2000	Assays, GC, GL, Lc	2.20368	T-4414
Côté, Fortune	Barber, R.A.	1998-2000	Assays, GL, IP, Lc, Pr	2.20604, OP99-352	T-4470
Deloro	Globex Mining Enterprises Inc.	2000	Assays	2.20287	T-4385
Deloro	Tremblay, M.A.	1998	Assays, Pr, Samp, Tr	2.20229	T-4429
Denton	Bonhomme, J.-C.	1999	DD - 1 - 150m	2.20226	T-4370
Denton	Explorers Alliance Corporation	2000	IP, Lc	2.20417	T-4428
Denton	Explorers Alliance Corporation	1998-1999	Assays, DD - 5 - 764m	2.20574	T-4453
Denyes	Patric, D.F.	1998	Assays, DD - 3 - 949m	2.18857	T-4445
Depencier et al. (5 townships)	Falconbridge Limited	1974-1999	DD - 18 - 2880m, GC, TM	Donation	T-4452
Desrosiers, Genoa	Canadian Royalties Corp.	1999	Assays, GC, GL, GM, HLEM, Lc, Pr	2.20112	T-4342
Duff, Mann	East West Resource Corporation	2000	IP, Lc	2.20472	T-4435
Duff, Mann	Hill, L.E.	1999-2000	DD - 1 - 200m, GM, HLEM, IP, Lc	2.20393	T-4422
Ecclestone	Silverman, G.C.	1999-2000	HM, Samp	2.20389	T-4421
Ecclestone	Silverman, G.C.	1999	GM, Lc, VLFEM	2.20383	T-4451
Ecclestone	Silverman, G.C.	2000	HM, Samp	2.20576	T-4463
Ecclestone	Silverman, G.C.	2000	Assays, GC	2.20649	T-4475
Evans, Lemoine, Warren	Atkinson, P.J.	1998	Assays, Pr, Samp	OP98-330	T-4378
Farquhar	Fournier, E.	1999	Assays, DD - 2 - 969ft, Str, Tr	2.20259	T-4447
Fenton	Berland Resources Ltd.	2000	GM, Lc	2.20187	T-4366
Fenton	BRC Development Corporation	1999	Assays, GL, GM, HM, Lc, Pr, Samp, Str, Tr, VLFEM	2.20127	T-4425
Fenton	Falconbridge Limited	1998	GM, HLEM, Lc	2.20011	T-4322
Fintry	Algoma Ore Properties, Limited	1961-	Assays, DD - 2 - 947ft, GEM,	Donation	T-355

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
		1965	GM, HLEM, Pet		
Fleck	McKinnon, D.	2000	DD - 4 - 275m	2.20113	T-4411
Fox River, North of Fox River	Diatreme Explorations Inc.	1999	AM, Lc	2.20003	T-4364
Fripp	Fife, J.K.	1997	DGP, MM	2.19890	T-4349
Garnet	Mortimer, C.H.	1999	DD - 2 - 752ft, Str	2.20320	T-4443
Garvey	Morgan, J.H.	2000	Pr	2.20398	T-4416
Garvey	Morgan, J.H.	2000	Pr	2.20392	T-4419
Garvey	Morgan, J.H.	2000	Assays, Samp	2.20475	T-4436
Geikie	Driver Resources Inc.	1999	Assays, DD - 3 - 543m	2.20293	T-4396
Genoa, Marion	Jefferson Mining Corporation	1909-1917	Assays, GL	Donation	T-4358
Godfrey	Explorers Alliance Corporation	1999	Assays, DD - 2 - 573m	2.20034	T-4330
Godfrey	Explorers Alliance Corporation	2000	HLEM	2.20216	T-4368
Godfrey	Explorers Alliance Corporation	2000	DD - 3 - 591m	2.20225	T-4369
Godfrey	Explorers Alliance Corporation	2000	GM, HLEM, Lc	2.20262	T-4393
Godfrey	Falconbridge Limited	1999	Assays, DD - 2 - 387m	2.19961	T-4317
Godfrey et al. (4 townships)	Falconbridge Limited	1999-2000	DD - 2 - 401m, DGP, GM, HLEM, Lc, TEM	2.20286	T-4394
Greenlaw	Gibson, D.L.	1999	Assays, DD - 3 - 307m	2.20290, OP99-182	T-4387
Groves	Anderson, S.D.	1997-1999	Assays, Pr	2.19724	T-4321
Halliday, Hutt	Falconbridge Limited	1999	TEM	2.20299	T-4391
Halliday, Hutt	Falconbridge Limited	1998	GM, HLEM, Lc	2.20327	T-4407
Hamlet, Killmer, Pitt	McKinnon, D.	2000	DD - 5 - 700ft	2.20615	T-4476
Hanlan et al. (13 townships)	Algoma Ore Properties, Limited	1956-1972	AEM, AM, DD - 15 - 6691ft, GC, HLEM, VLEM	Donation	T-4400
Hanna	Queenston Mining Inc.	2000	Assays, DD - 1 - 200m	2.20441	T-4433
Hannard	Horne, J.D.	1998	GC	OP98-394	T-4376
Hogg	Algoma Ore Properties, Limited	1955-1956	Assays, DD - 1 - 415ft, GL	Donation	T-4409
Holmuth	Pugg, C.C.	2000	DD - 6 - 1134m	2.20164	T-4352
Holmuth	Pugg, C.C.	2000	VLFEM	2.20167	T-4427
Horwood	Ross, F.J.	1999	Assays, Beep, Pr, Str, Tr	2.20400, OP99-150	T-4434
Horwood	Windsor, G.F.	1999	Assays, Pr, Str	2.20404	T-4437

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Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Huffman	Gagne, M.Y.	1999	Tr	2.20111	T-4339
Huffman	Gagne, M.Y.	2000	DD - 4 - 569ft	2.20509	T-4490
Huffman	Prospectors Alliance Corporation	1999	Assays, DD - 1 - 210m	2.20494	T-4456
Hutt	Inmet Mining Corporation	1999	Assays, DD - 5 - 930m	2.20110	T-4341
Hutt, Semple, Whitney	Robert, J.	1998	Assays, Pr, Samp, Str	OP98-332	T-4377
Hutt, Zavitz	Tremblay, M.A.	1997-1999	Assays, DD - 6 - 581m, GC, GL, GM, HLEM, Lc, TEM, VLFEM	2.19832	T-4335
Irish	Algoma Ore Properties, Limited	1960	DD - 1 - 260ft, GM	Donation	T-4360
Ivanhoe	Morin, R.J.	1999	Assays, GM, Pr, Str, Tr, VLFEM	2.20265	T-4446
Jamieson	Falconbridge Limited	1994	PEM	Donation	T-4464
Jamieson, Jessop	Falconbridge Limited	1998-1999	GM, HLEM, Lc	2.20033	T-4329
Keith	Denomme, R.C.	1998-1999	Assays, Lc, Pr, Samp	2.20403	T-4430
Kenogaming, Penhorwood	Kukatush Mining Corporation (1960) Ltd.	1961-1963	Assays, DD - 10 - 5171ft, Met	Donation	T-669
Kidd	Falconbridge Limited	1998	Assays, DD - 2 - 436m	2.20640	T-4479
Kidd	Falconbridge Limited	2000	Assays, DD - 2 - 2617m	2.20663	T-4485
Kilmer, Valentine	McKinnon, D.	2000	GM, VLFEM	2.20660	T-4484
Langmuir	Luhta, L.E.	2000	Assays, DD - 5 - 557m	2.20319	T-4403
Larkin, Lascelles	Algoma Ore Properties, Limited	1966	Assays, Pr	Donation	T-4408
Loveland	Explorers Alliance Corporation	2000	DD - 1 - 252m	2.20355	T-4423
Loveland	Explorers Alliance Corporation	2000	PEM	2.20515	T-4458
Loveland	Explorers Alliance Corporation	2000	GM	2.20581	T-4467
Loveland	Explorers Alliance Corporation	2000	Assays, DD - 2 - 447m	2.20730	T-4488
Loveland	Meunier, D.	1999	DD - 1 - 560m	2.19956	T-4316
Loveland	Meunier, D.	1998	GM	OP98-240	T-4382
Loveland	Meunier, D.	2000	Str	2.20402	T-4432
Loveland	Meunier, D.	2000	Str	2.20577	T-4486
Lucas	Falconbridge Limited	2000	GM, HLEM, Lc	2.20169	T-4354
Macdiarmid	Aur Resources Inc.	1999	IP, Lc, RES	2.19909	T-4357
Mahaffy, Reid	Falconbridge Limited	1998-2000	Assays, DD - 6 - 1515m, DGP, GM, HLEM, Lc, TEM	2.20231	T-4424
Mann	Falconbridge Limited	1999	Assays, DD - 2 - 304m	2.20163	T-4351
Mann	Falconbridge Limited	1999	Assays, DD - 2 - 1031m	2.20695	T-4471
Mann	Smith, W.K.	1999	Assays, GC	2.20227	T-4371

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
Mann	Ward, J.T.	1998	GC, GM, Grav, Lc, VLEM	2.20189, OP98-382	T-4359
Massey	Dupont, J.D.C.	1999	Assays, DD - 4 - 1022	2.20460	T-4444
Massey	Laforest, D.	1999	GM, HLEM, VLFEM	2.20228	T-4372
Massey	Maillet, P.S.	1999	GL, Lc	2.20043	T-4333
Massey, Whitesides	Lalonde, D.J.	2000	DD - 1 - 188m	2.20396	T-4448
Matheson	St. Andrew Goldfields Ltd.	1999-2000	GC	2.20260	T-4392
McCart	Pyke, D.R.	2000	Assays, Samp	2.20401	T-4438
Michie	Dunn, G.C.	1998	Pr	OP98-012	T-4383
Moberly	Explorers Alliance Corporation	2000	DD - 2 - 321m	2.20665	T-4487
Moberly, Thorburn	Lalonde, D.J.	1998-1999	GM, Lc, Pr, TEM	2.19812	T-4311
Moher, Semple	Panagapko, D.A.	1999	Assays, GC, Pr, Samp	2.20291, OP99-190	T-4395
Mountjoy	Comaplex Minerals Corp.	1999	IP	2.20588	T-4468
Nesbitt	Pyke, D.R.	2000	Assays, DD - 1 - 176m	2.20104	T-4337
Ogden	Canamax Resources Inc.	1982	Assays, DD - 6 - 1053m, GM, VLFEM	63.4117	T-4362
Ogden	Echo Bay Mines Ltd.	2000	Assays, GC, GL	2.20504	T-4455
Prosser	Falconbridge Limited	1999	Assays, DD - 1 - 209m	2.20736	T-4489
Raney	Salo, J.-A.G.	1999	Assays, DD - 1 - 251m	2.20109	T-4338
Reid	Falconbridge Limited	1998-1999	GM, HLEM, Lc	2.20041	T-4331
Renesig Creek	Algoma Ore Properties, Limited	1961-1981	DD - 7 - 2276ft, GL, Met	Donation	T-4399
Robb	Explorers Alliance Corporation	1998	DD - 1 - 213m	2.19963	T-4319
Robb	Explorers Alliance Corporation	1998-1999	Assays, DD - 7 - 1158m	2.20379	T-4420
Roche	Algoma Ore Properties, Limited	1957-1958	Assays, DD - 1 - 365ft, GC, GEM	Donation	T-4398
Shaw	Nortem Mining & Exploration	1999	Bulk	2.20106	T-4418
Shaw	Nortem Mining & Exploration	1999	Assays, Samp	2.20578	T-4462
Shearer	Silverman, G.C.	1998-2000	HM	2.20632	T-4478
Sheraton, Thomas	Maple Minerals Inc.	2000	Assays, DD - 5 - 730m	2.20237	T-4374
Sothman	Filo, J.K.	1999-2000	Assays, Pr, VLFEM	2.20288	T-4386

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Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File
South of Ridge Lake	MCK Mining Corp.	1999	Assays, DD - 14 - 1771m	2.19960	T-4363
Stock	St. Andrew Goldfields Ltd.	1999	Assays, DD - 1 - 964ft	2.20032	T-4350
Stock	St. Andrew Goldfields Ltd.	1999	Assays, DD - 1 - 512m	2.20405	T-4431
Stock	St. Andrew Goldfields Ltd.	1998	Assays, DD - 2 - 462m	2.20635	T-4482
Stock	St. Andrew Goldfields Ltd.	1998	Assays, DD - 1 - 585m	2.20634	T-4483
Swayze	Scott, D.S.	1998-1999	Assays, Str, Tr	2.20397	T-4474
Thorburn	Raine, B.N.	2000	Assays, DD - 1 - 152m	2.19936	T-4384
Tisdale	Caron, M.G.	1998-1999	GM, Lc, VLFEM	2.20330	T-4402
Tisdale	Davidson Tisdale Ltd.	1999	GL	2.19901	T-4312
Tisdale	Davidson Tisdale Ltd.	1998	Assays, DD - 1 - 101ft	2.19892	T-4336
Tisdale	Hollinger Consolidated Gold Mines Ltd.	1985	Assays, DD - 1 - 181m, GM, GEM, IP, VLFEM	Donation	T-4477
Tisdale	Placer Dome (CLA) Limited	2000	Assays, DD - 1 - 995ft	2.20525	T-4461
Tisdale	Pyke, D.R.	1999	Assays, DD - 1 - 116m	2.19964	T-4320
Tisdale	Pyke, D.R.	1998	Assays, GC, GL, Pet, Str	OP98-284	T-4380
Tisdale	Pyke, D.R.	1998-1999	GC, GL	2.20321	T-4401
Tisdale	Pyke, D.R.	1999-2000	Assays, DD - 2 - 515m	2.20318	T-4404
Tooms	Kennecott Canada Exploration	1998-2000	HM, Pr, Samp	2.20153	T-4417
Turnbull	Anderson, S.D.	2000	GM, HLEM, Lc	2.20186	T-4365
Turnbull	Explorers Alliance Corporation	2000	Assays, DD - 4 - 986m	2.20170	T-4355
Wark	Falconbridge Limited	1999	Assays, DD - 1 - 203m	2.20694	T-4469
Warren	Purechem Limited	1999-2000	Assays, IM, Pet, Samp, Tr	2.20399	T-4442
West of Sunday	Franco-Nevada Mining Corporation Limited	1996-1997	Assays, DD - 41 - 10030m	2.19767	T-4310
Whitney	Noranda Mining & Exploration	1998-1999	Assays, DD - 2 - 1029m, GC, GL, IP, Lc, Pr	2.20252	T-4413
Whitney	Robert, J.	1999	DGP	2.20292	T-4388

Table 11. Publications received by the Timmins Regional Resident Geologist Office in 2000.

Title	Author	Type and Year of Publication
Report of Activities, 1999, Resident Geologist Program: Timmins and Sault Ste. Marie Districts	Atkinson, B.T., Hailstone, M.B., Ravnaas, C.B., et al.	Ontario Geological Survey (OGS) Open File Report 6006, 2000
Summary of Field Work and Other Activities, 2000	Ayer, J.A., Baker, C.L., Kelly, R.I., et al.	OGS Open File Report 6032, 2000
Late Archean rock types and controls on gold mineralization in the southern Abitibi greenstone belt of Ontario	Ayer, J.A., Berger, B., Johns, G., et al.	GAC-MAC Field Trip Guidebook B3, 1999
Geological Compilation of the KIRKLAND LAKE AREA, Abitibi Greenstone Belt	Ayer, J.A. & Trowell, N.F.	OGS MAP P.3425, 2000
Quaternary Geology, RADISSON LAKE AREA	Bajc, A.F. & Paterson, J.T.	OGS MAP 2610, 2000
Quaternary Geology, PEYERLONG LAKE AREA	Bajc, A.F. & Paterson, J.T.	OGS MAP 2611, 2000
Quaternary Geology of the RAMORE AREA	Baker, C.L.	OGS MAP 2650, 2000
Geology of the Kamiskotia Area	Barrie, C.T.	OGS Study 59, 2000
Geology of the KAMISKOTIA AREA	Barrie, C.T.	OGS MAP P.3396, 2000
Canadian Law of Mining	Barton, B.J.	Text, 1993 *
Geology of the Monteith Area	Berger, B.R.	OGS Open File Report 6024, 2000
Geology of Tully and Little Townships	Berger, B.R.	OGS Open File Report 6025, 2000
World-class Archean vein gold deposits of the Porcupine Camp, Timmins, Ontario	Brisbin, D. & Pressacco, R.	GAC/MAC Field Trip A3, 1999
Overview of trends in Canadian mineral exploration / Survol des tendances observees dans l'exploration minerale canadienne [French and English versions]	Canadian Intergovermental Working Group on the Mineral Industry	Report, 1999
Provincial Geologists Journal, 1999, Volume 17	Commission of Provincial Geologists	Report, 1999
Ordovician and Silurian fossils and strata of the Lake Timiskaming outlier	Copper, P. & Armstrong, D.K.	GAC-MAC Field Trip Guidebook B2, 1999
Porcupine Camp & Tisdale Township	Draper, K.	Text, 2000
FP Survey, 1999: Predecessor & Defunct (mining companies)	Financial Post	Report, 1999
GEONICS EM39 Borehole conductivity meter: Selected papers and examples	GEONICS Limited	Manual, 1995 *
PROTEM TDEM Sounding Systems: Principles and applications	GEONICS Limited	Manual. 1995 *
GEONICS PROTEM TDEM Systems: Mining Applications	GEONICS Limited	Manual *
Digest of the Mining Laws of Canada, 5th Edition	Graves, H.A. & Potter, G.R.L.	Text, 1957
Volcanism and volcanic rocks	GSC Seminar Series	GSC Open File Report 164, 1973 *
Provenance of diamonds in the glacial drift of the Great Lakes region, North America	Gunn, C.B.	University of Western Ontario, M.Sc. Thesis, 1967
The giant Kidd Creek volcanogenic massive sulfide deposit, Western Abitibi subprovince, Canada	Hannington, M.D. & Barrie, C.T., eds	Economic Geology Monograph 10, 1999
Report of Activities, 1999, Resident Geologist Program: Red Lake and Kenora Districts	Hinz, P., Storey, C.C., Gosselin, S.D.M., et al.	OGS Open File Report 6003, 2000
Mishibishu Lake Area high density regional lake sediment and water geochemical survey, northern Ontario	Jackson, J.E.	OGS Open File Report 6039, 2000
Lake sediment and water geochemical data from the Mishibishu Lake Area high density lake sediment and water geochemical survey, northern Ontario	Jackson, J.E.	OGS Dataset MRD 66, 2000
Precambrian Geology, SHINING TREE AREA (WEST HALF)	Johns, G.W.	OGS MAP P.3420, 2000

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Title	Author	Type and Year of Publication
Davidson Tisdale Mines: Tisdale Township Properties	Kirwan, J.L.	Report, 1983
Gold Fever: The art of panning and sluicing	De Lorenzo, L.	Text, 1984
Report of Activities, 1999, Resident Geologist Program: Thunder Bay North and Sioux Lookout Districts	Mason, J.K., Farrow, D., Seim, G., et al.	OGS Open File Report 6004, 2000
Economic geology of the platinum metals	Mertie, J.B., Jr.	USGS Professional Paper 630, 1969 *
Report of Activities, 1999, Resident Geologist Program: Kirkland Lake and Sudbury Districts	Meyer, G., Cosec, M., Grabowski, G.P.B., et al.	OGS Open File Report 6007, 2000
Overburden as a media for kimberlite, base metal and gold exploration, Wawa region, northeastern Ontario	Morris, T.F.	GAC/MAC Field Trip B6, 1999
Kimberlite, base metal, gold and carbonatite exploration targets, derived from overburden heavy mineral data, Killala Lake area, NW Ontario	Morris, T.F., Sage, R.P., Crabtree, D.C., & Pitre, S.A	OGS Open File Report 6013, 2000
Kimberlite, base metal, gold and carbonatite exploration targets, derived from overburden heavy mineral data, Killala Lake area, NW Ontario	Morris, T.F.	OGS Dataset MRD 52, 2000
Foleyet--Missinaibi Area lake sediment survey: Operation Treasure Hunt--Area A	Ontario Geological Survey[1]	Open File Report 6014, 2000
Lake sediment and water quality data from the Foleyet--Missinaibi Area: Operation Treasure Hunt--Area A	Ontario Geological Survey[1]	Dataset MRD 54, 2000
Nakina - Longlac Area lake sediment survey: Operation Treasure Hunt--Area B	Ontario Geological Survey[1]	Open File Report 6035, 2000
Lake sediment and water quality data from the Nakina - Longlac Area: Operation Treasure Hunt--Area B	Ontario Geological Survey[1]	Dataset MRD 64, 2000
CD: Kimberlite pipe modelling from magnetic grids	Ontario Geological Survey[1]	Dataset ERLIS 1038, 2000
Airborne Geophysical Survey, COCHRANE AREA	Ontario Geological Survey[1]	MAPS 82 000 to 82 006, 2000
CD: Cochrane Area ; Ontario Airborne Geophysical Surveys, Grid and Vector data	Ontario Geological Survey[1]	Dataset 1100b, 2000
CDs (2): Cochrane Area ; Ontario Airborne Geophysical Surveys, Profile data	Ontario Geological Survey[1]	Dataset 1100d, 2000
Airborne Geophysical Survey, KIRKLAND LAKE AREA	Ontario Geological Survey[1]	MAPS 82 028 to 82 046, 2000
Airborne Geophysical Survey, MATHESON AREA	Ontario Geological Survey[1]	MAPS 82 016 to 82 024, 2000
CD: Matheson Area ; Ontario Airborne Geophysical Surveys, Grid and Vector data	Ontario Geological Survey[1]	Dataset 1101b, 2000
CD: Matheson Area; Ontario Airborne Geophysical Surveys, Profile data	Ontario Geological Survey[1]	Dataset 1101d, 2000
Airborne Geophysical Survey, TEMAGAMI AREA	Ontario Geological Survey[1]	MAPS 82 065 to 82 069, 2000
CD: Temagami Area; Ontario Airborne Geophysical Surveys, Grid and Vector data	Ontario Geological Survey[1]	Dataset 1103b, 2000
CD: Temagami Area; Ontario Airborne Geophysical Surveys, Profile data	Ontario Geological Survey[1]	Dataset 1103d, 2000
Airborne geophysical survey: REID - MAHAFFY Test Site Survey	Ontario Geological Survey[1]	Dataset MRD 55, 2000
Final Report, October 2000: The economic and fiscal contribution of the mining industry in Ontario	Ontario Mining Association	Report, 2000
Geological classification of Canadian gold deposits	Poulsen, K.H., Robert F. & Dube, B.	GSC Bulletin 540, 2000

Title	Author	Type and Year of Publication
A knowledge-based system for regional mineral resource assessment	Reboh, R. & Reiter, J.	USGS Report, 1983
Quaternary Geology, WATABEAG RIVER AREA	Richard, J.A. & McClenaghan, M.B.	OGS MAP 2658, 2000
Quaternary Geology, PORQUIS JUNCTION AREA	Richard, J.A. & McClenaghan, M.B.	OGS MAP 2659, 2000
Taxation of Canadian mining income	Roche, J.H.G. & Sinclair, B.R.	Text, 1990 *
The "Sandor" diamond occurrence, Michipicoten greenstone belt, Wawa: A preliminary study	Sage, R.P.	OGS Open File Report 6016, 2000
Kimberlites of the Lake Timiskaming Structural Zone: Supplement	Sage, R.P.	OGS Open File Report 6018, 2000
Kimberlites of the Attawapiskat Area, James Bay Lowlands, Northern Ontario	Sage, R.P.	OGS Open File Report 6019, 2000
Kimberlite heavy mineral indicator data, Attawapiskat Area, James Bay Lowlands, Northern Ontario	Sage, R.P.	OGS Dataset MRD 60, 2000
Report of Activities, 1999, Resident Geologist Program: Southeastern & Southwestern Districts, Mines & Minerals Information Center	Sangster, P.J., McGuinty, W.J., Papertzian, V.C., et al.	OGS Open File Report 6008, 2000
Report of Activities, 1999, Resident Geologist Program: Thunder Bay South Districts	Schnieders, B.R., Scott, J.F., Smyk, M.C. & O'Brien, M.S.	OGS Open File Report 6005, 2000
Wawa - Dubreuilville Area Mines Inventory, June 3, 1988	Spooner, J. & Kilpatrick, L.R.	Report, 1988
Geological report of Sudbury and Algoma districts on proposed Highway 101, Chapleau to Wawa	Szenasi, A.S.	Report, 1962
Regional distribution of platinum, palladium, gold, kimberlite indicator minerals and base metals in surficial sediments, River Valley Area, Northeastern Ontario	Tardiff, N.P.	OGS OFR 6010, 2000
Till, B-horizon soils and humus compositional database, River Valley area, Northeastern Ontario	Tardiff, N.P.	OGS Dataset MRD 53, 2000
Abstracts for Diamonds in Eastern Canada, Oct. 24, 2000	Toronto Geological DiscussionGroup	Symposium Papers, 2000
Kapuskasing, 1921 - 1996: We only came for 3 years...	Town of Kapuskasing	Text, 1996 *
Brief: Geomorphology and geology of Lake Superior Provincial Park, Ontario	Tracey, A.G.	Report, 1971
Data for 210Pb dating of four peat cores from the vicinity of Detour Lake and Kinosheo Lake, Ontario, and Fort Simpson, NWT	Turner, L.J. & Kettles, I.M.	GSC Open File 3858, 2000
Minerals Yearbook: Metals and minerals 1996, Volume I	United States Geological Survey	Report, 1998
Precambrian Geology, WATABEAG LAKE AREA	Vaillancourt, C.	OGS MAP P.3421, 2000
Gold deposition in the western Abitibi greenstone belt and its relation to regional metamorphism	Van Hees, E.H.P.	University of Michigan Ph.D. Thesis, 2000 *
Report on the findings of the mining operations socioeconomic impact study	Wawa Community Adjustment Committee	Report, 1991

* *The Timmins Regional Resident Geologist's Office wishes to gratefully acknowledge the generosity of the following donors during 2000: E.H.P. van Hees; the Town of Kapuskasing; R.Ferguson (MNDM).*

[1] *An Operation Treasure Hunt project*

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Timmins Regional Resident Geologist District (Wawa Area) – 2000

by

A. C. Wilson, D. M. Draper and P. J. Hope

2000

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TIMMINS REGIONAL RESIDENT GEOLOGIST DISTRICT (WAWA AREA) – 2000

A. C. Wilson[1] , D. M. Draper[2] and P. J. Hope[3]

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INTRODUCTION

The announcement of a new diamond discovery 15 km north of Wawa in early 2000 rekindled interest in the mineral potential of the Michipicoten area during the year. Following announcement of this discovery, six additional companies had entered the hunt for diamonds in the area. By year's end, 10 new diamond occurrences had been discovered. In addition, two new kimberlite occurrences had been confirmed by Pele Mountain Resources Inc. (Riggs Township) and Tri Origin Exploration Ltd. (McMurray Township).

Both the high-grade Edwards Mine and the Eagle River Mine continued operation this year. The shaft-sinking project at the Eagle River Mine made headway and by year's end, the shaft had passed the 220-metre level which is well on the way to the first-phase target of 550 metres. River Gold Mines Ltd. completed the purchase of the Edwards Mine property in February and announced the acquisition of a 75% interest in the Magnacon properties in the Mishibishu Lake area.

Twenty-one active exploration programs were reported in the Wawa area this year, including 6 projects operating on lands administered by Wagner Forest Management. Clients interested in lands administered by Wagner are invited to contact them directly for information on land disposition. Clients can obtain geotechnical and geological reports and maps for these areas from the Resident Geologist Program, Ontario Geological Survey.

A summary of assessment files received for the Wawa area and housed in the Timmins Regional Resident Geologist office is documented in Table 4.

MINING ACTIVITY

Total production and reserves for the two gold mines operating in the Wawa area is summarized in Table 1. Historic gold production for the Michipicoten greenstone belt is summarized in Table 2. The locations of the producing mines can be found on Figure 1.

River Gold Mines Ltd. – Eagle River Mine

The Eagle River Mine is located on the north shore of Lake Superior, approximately 50 km west of the town of Wawa, in the Mishibishu Lake greenstone belt. Access to the mine and mill facilities is via a 70 km long gravel road leading south from the Trans-Canada Highway. The River Gold mill is located 17 km north of the Eagle River Mine.

River Gold Mines Ltd. resumed shaft-sinking at the mine in March 2000. By year's end, the shaft had passed the 220-metre level which is well on the way to the first-phase target of 550 metres. Sinking should be completed by

mid-2001 and the shaft should be operation in early 2002. On-going development of the high-grade No. 6 Zone will be enhanced by the shaft infrastructure. The shaft will also provide a base for deep exploration of the deposit. To date, the company has spent about $9 million on the shaft project including surface infrastructure. Approximately $2.1 million was spent on shaft development at Eagle River during the 2000 fiscal year (River Gold Mines Ltd., *press release*, November 24, 2000). Presently, the mine is accessed by a decline ramp and the ore is trucked to surface. Once the shaft is completed, River Gold expects to realize a cost saving of US$15 per ounce due to reduced trucking costs.

Some highlights of the underground development work include: a drift in the No. 6 Zone averaging 17.48 g/t gold along a strike length of 150 m with an average width of 1.93 m, a drift in the No. 8 Zone averaging 13.18 g/t gold along a length of 106 m with an average width of 2.2 m and a drift in the No. 2 Zone that averaged 11.83 g/t gold along a length of 100 m with an average width of 3.10 m (River Gold Mines Ltd., *press release*, November 24, 2000).

Mining operations at Eagle River utilize trackless equipment. Both shrinkage and longhole stoping methods are employed. The Eagle River Mine employs 140 people.

In March of 2000, River Gold acquired a 75% interest in the Magnacon mine property for approximately $0.5 million. The property was acquired from the Windarra Group of companies that includes Golden Goose Resources Inc., Westward Explorations Ltd. and Windarra Minerals Ltd. River Gold has undertaken to spend $2 million on exploration on the property over the next 4 years (Golden Goose Resources Inc., River Gold Mines Ltd., Westward Explorations Ltd. and Windarra Minerals Ltd., *press release*, March 3, 2000). The property consists of 60 claims (960 hectares) and covers 9 kilometres of the Mishibishu Lake Deformation Zone and is along strike from River Gold's Mishi deposit. The Magnacon property hosts an estimated resource of 1.47 million tons at an average grade of 0.19 ounce per ton gold.

Table 1 Mine production and reserves in the Wawa Area 2000.

Mine	Production in 1999		Production in 2000		Reserves at end of 1999	
	Tonnage @ Grade	Total Commodity	Tonnage @ Grade	Total Commodity	Tonnage	Grade
River Gold Mines Ltd., Eagle River Mine	161 700 tonnes @ 9.58 g/t Au	48 200 oz Au	n/a	n/a	1 511 400 tonnes	10.78 g/t
River Gold Mines Ltd., Edwards Mine	105 300 tonnes @ 12.6 g/t Au (estimated)	39 031 oz Au	n/a	n/a	176,500 tonnes	13.31 g/t
River Gold Mines Ltd., **Combined Production**	268 500 tonnes @ 10.45 g/t Au	87 400oz Au	248 000 tonnes @ 7.6 g/t Au	60 650 oz Au	n/a	n/a

**Production figures for 2000 are available as combined totals only for the Eagle River and Edwards Mines for the first nine months of the year (River Gold Mines Ltd., press release, November 24, 2000)*

River Gold Mines Ltd. – Edwards Mine

The Edwards Mine is located in Jacobson Township, 100 km northeast of the River Gold mill. Ore from the mine is trucked to the mill, stockpiled and then run through the mill in a single batch.

Development work has now been completed to the 227-metre vertical level . During the year, an underground diamond drilling program was undertaken prior to development beyond the 285-metre level (River Gold Mines, Annual Information Form, April 14, 2000).

In February 2000, the sale of the two mining leases comprising the Edwards Mine and the adjacent Plowman Claim was completed. The March 1996 sublease agreement between River Gold Mines Ltd. and VenCan Gold Corporation has been terminated and the remaining 43 claims in VenCan's Edwards Gold Property have been returned to VenCan (VenCan Gold Corporation, *press release*, February 18, 2000).

The mine is accessed by decline and longhole mining methods are employed underground. Approximately 60 people are employed at the Edwards Mine.

EXPLORATION ACTIVITY

The location of exploration activities conducted in the Wawa area in 2000 are shown on Figure 1 and summarized in Table 3. Table 4 summarizes the Wawa area assessment files received in the Timmins Regional Resident Geologist office during the year. Details on selected mineral deposits not being mined in the Wawa area can be found in Table 5.

Band-Ore Resources Ltd. – GQ Diamond Property

In February 2000, Band-Ore Resources Ltd. acquired the rights to a 25 km^2 property in Musquash Township from Privco, a private Ontario company. The property is situated approximately 15 kilometres northwest of Wawa and lies within the land holdings administered by Wagner Forest Management.

An initial diamond discovery was made in the fall of 1999 by prospectors Michael Tremblay, Terry Nicholson and Jack Robert. Two samples of xenolith-bearing lamprophyre were processed by Kennecott Canada Exploration at their Thunder Bay laboratory and returned a total of 54 diamonds (10 macrodiamonds and 44 microdiamonds) from 134.0 kg of sample material. One stone measured 1.01 mm in one dimension and all of the stones were reported to be white and transparent (Band-Ore Resources Ltd., *press release*, February 10, 2000).

Due diligence sampling by the company confirmed the original discovery. A duplicate sample weighing 54.6 kg, collected by Band-Ore returned 98 microdiamonds (Band-Ore Resources Ltd., *press release*, February 22, 2000).

Over the course of the exploration season, Band-Ore completed a 50-metre line spacing helicopter magnetic survey over the property, a program of outcrop washing and mapping and completed a 3 hole (75-metre) diamond drilling program on the original diamond discovery. A total of 177 bedrock samples weighing approximately 5300 kilograms wer collected and sent for microdiamond recovery. To date, the company has identified 6 diamondiferous occurrences on their property. All six occurrences are hosted within rocks originally mapped by the Ontario Geological Survey as heterolithic breccia (Band-Ore Resources Ltd., *press release*, November 22, 2000).

Core samples collected from the diamond drilling program were sent to Lakefield Research for diamond recovery. From a total of 6 core samples taken from two of the holes drilled (219.03 kg), Lakefield recovered 522 diamonds. A single sample weighing 30.17 kg from drill hole GQ-00-2 contained 434 diamonds (Band-Ore Resources Ltd., *press release*, May 29, 2000).

Dumont Nickel Inc. – Furnival Lake Property

Dumont Nickel Inc. joined the hunt for diamonds in the Wawa area by acquiring a 77 km^2 property in Menzies and Knicely townships from Wagner Forest Management.

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Prospecting on the property has led to the discovery of 35 lamprophyre dikes. By the end of the field season, only two of the lamprophyres had been analysed for diamonds. A 49.2 kg sample collected from Menzies Township contained 12 microdiamonds, eleven of which were described as diamond fragments. The twelfth microdiamond is a yellow macle (Dumont Nickel Inc., *press release*, July 21, 2000). Dumont has reserved samples from 31 of the 35 lamprophyres for further study.

Table 2: Historic Gold Production from the Wawa Area to the end of 1999

Mine Name	Township	In Production	Tons Milled	Oz. Au	Grade
Alden-Goudreau	Cowie	1937, 40, 43, 45	13 479	3220	0.276
Centennial	Naveau	1939-40	8612	610	14.1
Cline	Jacobson	1938-40, 1947-48	331 842	63 328	5.2
Darwin/Grace	McMurray	1902-03, 07-08, 10, 23, 25, 30, 35, 37, 40, 43-44	45 528	15 191	3.0
Deep Lake	McMurray	1936-1938, 1943	2790	1633	1.7
Eagle River	Point Isaac	1995-	517 494	168 900	11.1 g/t
Edwards	Jacobson	1938	1537	485	3.2
		1997-	202 425	82 296	12.9 g/t
Holdsworth Prospect	Corbiere	1933	60	10	6
Kremzar	Finan	1988-90	392 858	37 678	4.5g/t
Magino/Algoma Summit	Finan	1930-40, 1988-92	768 679 *	113 228	4.5 g/t
Magnacon	Mishibishu Lake	1989-90	165 000	15 356	10.7
Minto (includes Jubilee and Cooper)	McMurray	1929-1942	184 600	37 678	4.9
Murphy/Algold /Amherst	Abotossaway	1926-32, 36-38, 1940	23 211	2450	9.5
Norwalk/Manxman	Naveau	1904, 1910	820	60	13
Parkhill	McMurray	1902, 29, 30-38, 40-44	125 778	54 301	2.3
Ranson	Rabazo	1939	774	156	4.36
Renabie	Leeson	1947-70, 1981-91	5 583 895	1 100 000	0.2
Smith/Van Sickle	McMurray	1935-36	9228	536	17.2
Stanley	McMurray	1936	1963	84	23.3
Surluga	McMurray	1968-69, 1988-89	87460	8898	n.a.

** Production figures for 2000 for the Eagle River and Edwards Mines are available only as a combined total to the end of November 2000, and have not been included in this table. Total production for the two mines is projected to be 85 700 ounces of gold (G. Maynard, River Gold Mines Ltd., written communication January 2001)*

Golden Goose Resources Inc. – Magino Mine Property

The company completed a 19-hole (4040 ft.) surface diamond drilling program over the summer. The program was designed to determine the gold grade of previously mined out areas and to determine the suitability of using larger diameter core to obtain a more representative sample for assay. The drill program also provided additional assay data to reconcile previous grade estimates in mined out areas of the deposit and to assist with the recalculation of in-situ resources (Golden Goose Resources Inc., *press release*, January 18, 2001). The last published reserve for the deposit was 24 million tonnes (in all categories) at a grade of 1.68 g/t gold.

Kennecott Canada Exploration Inc. – Canabrava Diamond Corporation JV – Whitefish Lake and KAP South Projects

In early January, Kennecott Canada Exploration Inc. flew a high-resolution combined magnetic/EM survey over high priority targets in the Whitefish Lake and KAP South project areas. Ground magnetic and EM surveys were also completed over identified anomalies in order to establish diamond drilling targets. Because of the mild winter and poor ice conditions, only five of the targets were drill tested. No new kimberlites were discovered, but Kennecott reports that a number of interesting ultramafic lamprophyres were intersected. During the summer, Kennecott continued a program of follow-up till sampling. This focussed till sampling will assist in further defining areas for drill testing in the winter of 2000-2001 (Canabrava Diamond Corporation – Paramount Ventures and Finance Inc., *press releases*, February 8, 2000, March 31, 2000 and November 15, 2000).

The Whitefish Lake property is located 25 kilometres northeast of Wawa and comprises approximately 48 000 hectares of claims and leased land. It is 100% held by Canabrava Diamond Corporation. The KAP South Project area is one of three claim groups (65 000 ha total) located northeast of Wawa along the western margin of the Kapuskasing Structural Zone. These properties are jointly held by Canabrava Diamond Corporation and Paramount Ventures and Finance Inc.

Patricia Mining Corp. – Kremzar Mine Property and Island Gold Project

Patricia Mining Corp. announced the results of a near-surface resource estimate on their Island Gold Project in Finan Township. The near-surface inventory includes indicated resources of 106 569 tonnes at an average grade of 8.2 g/t gold (25 342 ounce gold) and inferred resources of 194 830 tonnes at an average grade of 7.5 g/t gold (42 728 ounces gold). This estimate is an evaluation of the resource that may be potentially extracted by surface mining or from mining the upper levels of the Kremzar Mine. The near-surface resource is part of a global resource of over 300 000 ounces of gold on the Island Gold property (Patricia Mining Corp. *press releases*, January 31, 2000 and March 17, 2000).

Exploration activity was concentrated on the No. 2 Zone this year. The zone was originally discovered by Algoma Ore Properties in 1925 and consists of a 45 to 50 metre long contorted quartz vein lying at the sheared contact between massive mafic and tuffaceous metavolcanic rocks. The No. 2 Zone was trenched, washed, mapped and sampled during the summer. Sampling returned values up to 20.11 g/t gold over 6 metres in an uncomposite interval, including 56.91 g/t gold over 1 metre and 53.69 g/t gold over 1 metre (Perkins 2000a). Gold mineralization occurs as very fine-grained free gold (<0.5 mm) within the quartz vein. Accessory sulphide minerals include pyrite, pyrrhotite and trace chalcopyrite.

The company also completed a 5-hole diamond drilling program on the North Shear Zone, Shore Zone, No. 8 Zone and the No. 3 Zone. Encouraging results were obtained from both the North Shear and the Shore zones. An intersection of 1.0 m averaging 8.09 g/t gold was obtained from the former property and an intersection of 2.5 m averaging 8.21 g/t gold from the latter. Narrow gold mineralization was intersected on the southern extension of the No. 3 Zone (0.5 m averaging 5.18 g/t gold) (Patricia Mining Corp., *press release*, September 13, 2000).

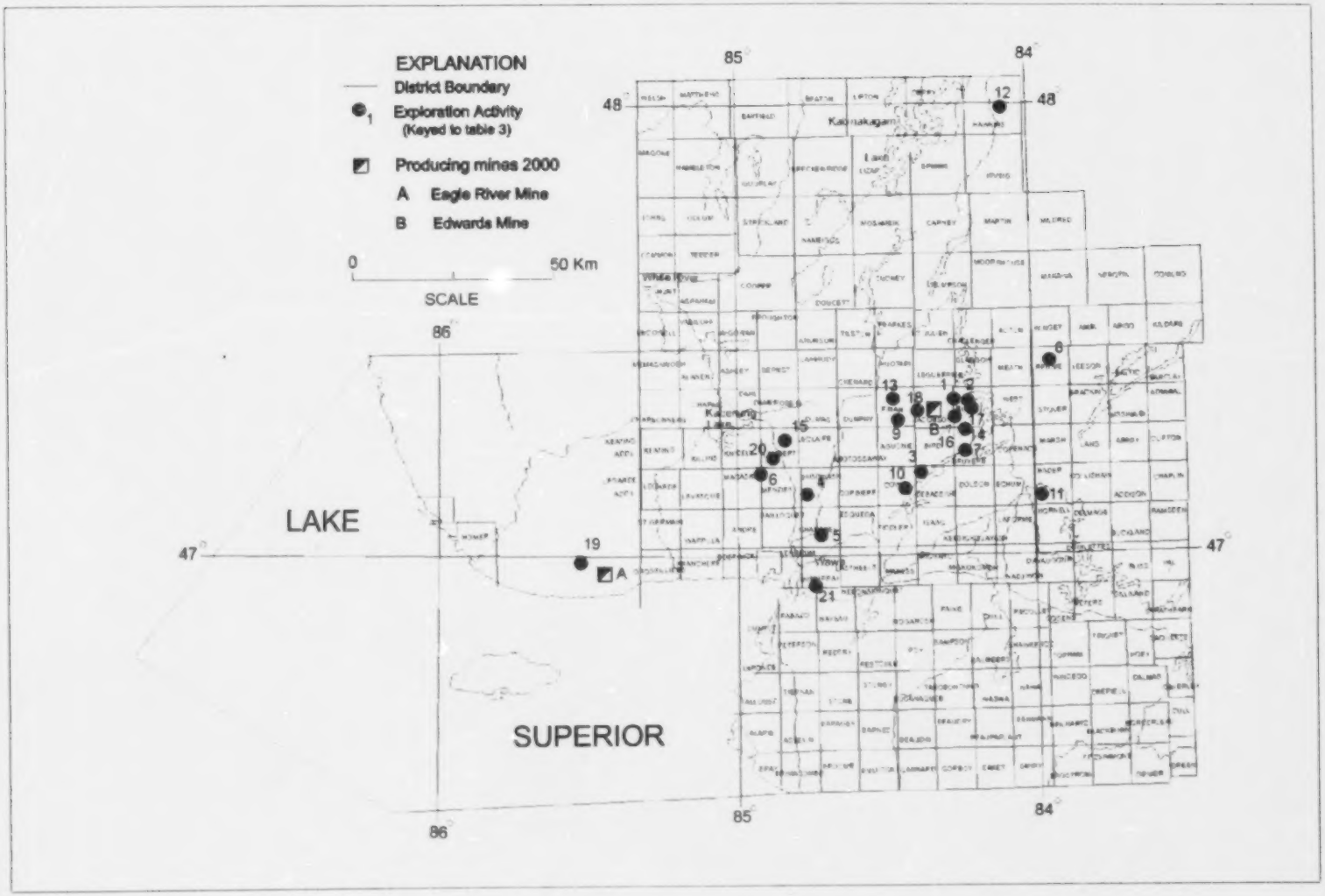

Figure 1. Wawa area, exploration, development and mining activity, 2000

Table 3. Exploration activity in the Wawa area in 2000.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARES ..... Airborne restistivity survey
Comp ..... Compilation
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological Survey
GM ..... Ground magnetic survey
GP ..... Ground geophysical survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IP ..... Induced polarization survey
Lc ..... Linecutting
Pr ..... Prospecting
Samp ..... Sampling (other than bulk)
Str ..... Stripping
TEM ..... Transient electromagnetic survey
Tr ..... Trenching
VLFEM ..... Very low frequency electromagnetic survey

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
1	Archibald, F. T. & J. Paynter (Manitou Mountain property)	Riggs Tp.	DD – 1 – 200 m
2	Archibald, J. C. (Manitou Mountain property)	Riggs Tp.	DD – 1 – 302 m
3	Bowes, J. W. and Porcheron, A. (Manitowick Lake property)	Debassige Tp. (Au)	Samp, Assays, Pr
4	Band-Ore Resources Ltd. (GQ property)	Musquash Tp. (diamond)	Samp, Assays, AM, Str, DD – 3 – 75m, GL
5	Dumont Nickel Inc.	Chabanel and Lendrum Tps. (Au, BM, diamond)	Pr, Samp, Assays
6	Dumont Nickel Inc. (Furnival Lake property)	Knicely and Menzies Tps. (diamond)	Samp
7	Falconbridge Limited (Bryure Southwest Grid)	Bruyere Tp.	GM, HLEM, Lc
8	Falconbridge Limited (Conboy Lake Project)	Rennie Tp. (BM)	GM, Lc, TEM, DD (1146 m)
9	Golden Goose Resources Inc. (Magino Mine Property)	Finan Tp. (Au)	DD – 19 – 4040 ft)
10	Kennecott Canada Inc. / Camabrava Diamond Corporation (Whitefish Lake Project)	Cowie, Fiddler, Isaac, ManessTps. (diamond)	GC, Lc, HLEM, DD, GM, GEM, AM, AEM, ARES, Pr
11	Kennecott Canada Inc. / Camabrava Diamond Corporation / Paramount Ventures and Finance Inc. (KAP South Project)	Laforme and Bader Tps. (diamond)	GM, GEM, DD
12	McKinnon Prospecting (Hawkins Township Property)	Hawkins Tp. (Au)	GM, IP, Lc

No	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity
13	Patricia Mining Corporation (Kremzar Mine Property)	Finan Tp. (Au)	Resource estimates, Str, Samp, Tr, GL, Assays, DD – 5 – 430 m
14	Patricia Mining Corporation (Tracanelli Occurrence)	Riggs Tp. (Au)	Tr, Samp, Assays, DD – 5 – 261 m
15	Pele Mountain Resources Inc. (Festival Property)	Lalibert Tp. (diamond)	Samp, 9.4 tonne sample, Pr, Str, GL, GP
16	Pele Mountain Resources Inc. (Vega Property)	Riggs and Jacobson Tps. (diamond)	Samp, HM
17	Pele Mountain Resources Inc. (Power Line Property)	Riggs Tp.	GM, VLFEM
18	River Gold Mines Ltd. (Edwards Mine Property)	Jacobson Tp.	GP
19	River Gold Mines Ltd. (Border Lake Property)	Pilot Harbour NE	GM, VLFEM, Lc
20	Spider Resources Inc. / KWG Resources Inc. (Sandor Property)	Lalibert Tp. (diamond)	10 tonne sample
21	Tri-Origin Exploration Ltd. (Wawa Project)	McMurray Tp. (diamond)	Pr, Samp, Assays, Comp

Patricia Mining Corp. – Tracanelli Occurrence

Patricia Mining Corp. conducted a program of stripping, channel sampling and diamond drilling (5 holes totaling 400 m) on the Tracanelli Occurrence in Riggs Township. As a result of this summer's exploration, three new sub-parallel quartz veins and quartz vein systems were discovered. Grab samples taken from these veins have returned values up to 45.0 g/t gold (Patricia Mining Corp., *press release*, June 20, 2000). Diamond drilling, completed early in the fall of 2000, intersected two zones of significant gold mineralization on the 110° striking vein system (1.0 m averaging 6.12 g/t gold and 0.5 m averaging 12.48 g/t gold) (Patricia Mining Corp., *press release*, September 13, 2000). The reader is directed to a more detailed property description in the Property Examination section of this report.

Pele Mountain Resources Inc. – Festival Property

The Festival Property is a 12 km^2 claim group located in Lalibert Township, approximately 25 km north of the town of Wawa. The property is adjacent to Band-Ore Resources Ltd.'s GQ Property and Spider Resources Ltd.'s Sandor Property.

Pele Mountain Resources completed an intensive program of prospecting, sampling, stripping and geological mapping on their Festival Property. To date, a total of 118 diamonds have been recovered from three showings on the property. A single yellow macrodiamond was recovered from a 35.2 kg bedrock sample at the Jubilee Showing (Pele Mountain Resources Inc., *press release*, July 7, 2000). The Destiny Showing has returned a total of 108 diamonds, 10 of which were macrodiamonds. The largest diamond measured 1.09 mm in length. The diamonds were recovered from both bedrock and weathered outcrop residuum (Pele Mountain Resources Inc., *press releases*, October 24, 2000 and January 3, 2001). A 9. 4 tonne bulk sample composed of bedrock and weathered material, was removed from the Destiny Showing in October 2000. This sample will be processed at Lakefield Research

Limited and will be paid for by Kennecott Canada Exploration Inc. (Pele Mountain Resources Inc., *press release*, January 15, 2001).

A third occurrence, named the P. C. Showing, has returned 9 diamonds, including 2 macrodiamonds from 1 kg of material concentrated from approximately 32 kg of weathered residuum (Pele Mountain Resources Inc., *press release*, January 8, 2001).

Both the Destiny and P. C. Showings are located in the southern part of the Festival Property. The Jubilee Showing, is located 4 km north of the Destiny and P. C. Showings. The Destiny Showing is hosted by xenolith-bearing lamprophyre that resemble the host of the diamondiferous Sandor Occurrence.

Tri Origin Exploration Ltd. – Wawa Project

Following the signing of the 1999 exploration agreement between Citadel Gold Mines Inc., Citabar Limited Partnership and Tri Origin Exploration Ltd., Tri Origin undertook an extensive program of data compilation primarily to re-evaluate the gold potential of the 24 km^2 property located in McMurray Township. Although initially interested in the property's gold potential, Tri Origin was also drawn to the diamond potential of the property.

Tri Origin sampled core from four previously drilled diamond drill holes, and collected samples from promising lamprophyre dike outcrops. Samples were sent to Lakefield Research Ltd. for microdiamond analysis. Additional samples were sent to R. L. Barnett Geological Consulting for petrographic study and mineral chemistry analysis. Microdiamond analysis of 25-kg composite samples was negative. Microprobe analysis of the rock samples revealed that some of the rocks are type II kimberlite (Tri Origin Exploration Ltd., *press release*, September 14, 2000).

In 2001, Tri Origin plans to complete ground electromagnetic and Induced Polarization surveys and diamond drilling to test anomalies interpreted to be associated with kimberlite pipes.

Table 4. Assessment files received for the Wawa District in 2000.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM..... Airborne magnetic survey
ARES..... Airborne resistivity survey
Beep..... Beep Mat Survey
Comp ..... Compilation
DD ..... Diamond drilling
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
HLEM..... Horizontal loop electromagnetic survey
HM..... Heavy mineral sampling
IP..... Induced polarization survey
Lc..... Linecutting
OP..... Ontario Prospectors Assistance Program
Pr..... Prospecting
Samp..... Sampling (other than bulk)
Str ..... Stripping
TEM..... Transient electromagnetic survey
Tr ..... Trenching
VLFEM..... Very low frequency electromagnetic survey

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Abbie Lake, Keating Additional	Gerdes, J.A., Charbonneau, G.G. & Thibodeau, R.E.	1998-1999	Assays, GL, Pr, Samp, Str	2.20116, OP99-161	WP Abbie Lake - 22
Abbie Lake, Keating Additional	Noront Resources Ltd.	1999	GL, Pr	2.19958	WP Abbie Lake - 21

WAWA AREA – 2000

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Abotossaway et al. (15 townships)	International Corona Resources/Tri-Basin Petroleum Ltd./Galveston Petroleum Ltd./Berle Oil and Gas Ltd.	1984	Comp	Donation	WP Abotossaway - 30
Abotossaway, Aguonie, Bird, Cowie, Corbiere, Leclaire, Keating, Killins	Corona Corporation	1989	Assays, GC, Pr, Samp, Str	Donation	WP Abotossaway - 29
Abotossaway, Aguonie, Bird, Leclaire, Musquash	Mascot Gold Mines Limited	1986	GL, Pr, Str, GC, DD	Donation	WP Abotossaway - 31
Aguonie	Sears, S.M., Babcock, G. & Barry, J.M.	1998	Assays, GC, GL, HM, Samp	OP98-207, OP98-208, OP98-209	WP Aguonie - 9
Bader, Collishaw, Lang, Marsh	Kennecott Canada Exploration/Canabrava Diamond Corporation	1998	AEM, AM, HM, GL	2.19770	WP Bader - 1
Bird	Sears, S.M., Babcock, G & Barry, J.M.	1998	Assays, HM, Pr, Samp	OP98-207, OP98-208, OP98-209	WP Bird - 3
Brackin, Marsh, Stover	Fraser, M.J.	1998	Assays, Beep, Pr, Samp, Str	OP98-138	WP Brackin - 42
Bruyere	Falconbridge Limited	2000	GM, HLEM, Lc	2.20488	WP Bruyere - 18
Chabanel, Lendrum	Dumont Nickel Inc.	2000	Assays, Pr, Samp	2.20579	WP Chabanel - 32
Corbiere	Sears, S.M., Babcock G. & Barry, J.M.	1998	Assays, Samp, Tr	OP98-207, OP98-208, OP98-209	WP Corbiere - 18
Cowie	Kennecott Canada Exploration	2000	AEM, AM, ARES	2.20285	WP Cowie - 5
Cowie	Sears, S.M., Babcock, G. & Barry, J.M.	1998	Assays, GL, Pr, Samp, Str, GC, HM	OP98-207, OP98-208, OP98-209	WP Cowie - 4
Debassige	Bowes, J.W. & Porcheron, A.R.	2000	Pr, Samp, Assays	2.20476	WP Debassige - 7
Derry	Algoma Ore Properties Limited	1957-1958	GC, GEM, GL, GM, DD, AEM	Donation	WT Derry - 8
Ermine	Algoma Ore Properties Limited	1957-1958	GEM, GM	Donation	WT Ermine - 5
Esquega	Firesand Resources Ltd	1989-1992	DD - 9 - 3822ft, GL, Lc, PEM, Pr, Samp, Str	Donation	WP Esquega - 23
Esquega	Plata-Peru Resources Inc.	1997	Assays, GM, Samp, Tr, VLFEM	Donation	WP Esquega - 28
Esquega	Plata-Peru Resources Inc.	1998	GL, GM, Pr, Samp, Str, VLFEM	Donation	WP Esquega - 29
Esquega	Soocana Explorations Ltd.	1992	Assays, Gl, GM, Lc, Pr, Samp, VLFEM	Donation	WP Esquega - 24

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Esquega	Soocana Explorations Ltd.	1993	Assays, GC, GL, GM, Lc, Pr, Samp, Str, Tr, VLFEM, GEM	Donation	WP Esquega - 25
Esquega	Soocana Explorations Ltd.	1994	Pr, Comp	Donation	WP Esquega - 26
Esquega	Soocana Explorations Ltd.	1996	Assays, GL, Samp, Str, Tr	Donation	WP Esquega - 27
Finan	Patricia Mining Corp.	2000	Assays, GL, Samp, Str, Tr	2.20575	WP Finan - 65
Hawkins	Algoma Ore Properties Limited	1957-1958	GEM, GM, DD – 3 – 2021.5 ft	Donation	WT Hawkins - 28
Hawkins	McKinnon Prospecting	2000	GM, IP, Lc	2.20491	WT Hawkins - 27
Irving	Algoma Ore Properties Limited	1957-1958	GEM, GM, DD – 2 – 1435 ft.	Donation	WT Irving - 2
Isaac	Kennecott Canada Exploration /Canabrava Diamond Corporation	1998	DD - 6 - 1134m	2.20151	WP Isaac - 1
Jacobson	Pele Mountain Resources Inc.	1998-1999	Assays, DD - 35 - 442m, GL	2.19753	WP Jacobson - 71
Keating	Corona Corporation	1989-1990	Assays, DD - 6 - 733m, GC, Pet, Samp, Str	Donation	WP Keating - 2
Laforme	Kennecott Canada Exploration	2000	DD - 1 - 110m	2.20155	WP Laforme - 1
Lastheels, McMurray	Feder, E.	1998	Assays, Samp, HM, Pr	2.19751	WP Lastheels - 09
Lastheels	Sears, S.M.	1999	GL, GM, Lc	2.20143	WP Lastheels - 10
Lipton	Algoma Ore Properties Limited	1957-1958	GC, GEM, GL, GM	Donation	WP Lipton - 1
Lizar	Algoma Ore Properties Limited	1958	GEM, GL, GM, GC, Dip Needle	Donation	WT Lizar - 21
Makawa	Algoma Ore Properties Limited	1957	GC, GEM, GL, GM	Donation	WP Makawa - 1
Martin, Carney, Irving	Algoma Ore Properties Limited	1957-1958	GC, GEM, GL, Dip Needle	Donation	WP Martin - 2
Meath, West, Riggs	Nicholson, T.S.	1999	Assays, GC, Str	2.20040	WP Meath - 12
Meath, West	Nicholson, T.S.	1998	Assays, Pr, GC, Tr	OP98-282	WP Meath - 11
Meath, West	Nicholson, T.S.	1998	Assays, GC, Pr, Tr	2.20000	WP Meath - 13
Mishibishu Lake	Battle Mountain Canada Ltd./Murgor Resources Inc.	1999	Assays, DD - 5 - 1923m	2.19943	WP Mishibishu Lake - 60
Mishibishu Lake	Battle Mountain Canada Ltd./Murgor Resources Inc.	1999	GM, IP, Lc	2.19959	WP Mishibishu Lake - 61
Mishibishu Lake	Battle Mountain Canada Ltd. - Murgor Resources Inc. – P. Gagne – A. E. Traverse	1999	Assays, GC, GL, Pr, Tr	2.19955	WP Mishibishu Lake - 62
Nameigos	Halverson, L.J., Cox, W.L. & Ternowsky, J.E.	1999	Assays, Pr, Str, Tr, Pet	2.20513, OP99-121	WP Nameigos - 5

Township or Area	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Nameigos	Kakeeway, D.N.	1999	Assays, Tr	2.20324, OP99-361	WP Nameigos - 4
Naveau	Reed Lake Explorations Limited	1992	Assays, GL, GM, Pr, Samp, VLFEM	Donation	WP Naveau - 13
Naveau	Reed Lake Explorations Limited	1992-1993	GC, GL, GM, Lc, Pr, Samp, Str, , Tr, VLFEM	Donation	WP Naveau - 14
Pilot Harbour, Point Isacor	River Gold Mines Ltd.	2000	GM, Lc, VLFEM	2.20380	WP Pilot Harbour NE - 21
Point Isacor	River Gold Mines Ltd.	1999	Assays, DD - 36 - 3074m	2.20301	WP Point Isacor - 19
Rennie	Falconbridge Limited	2000	GM, Lc, TEM	2.20447	WP Rennie - 14
Riggs	Archibald, F.T.	2000	DD - 1 - 200m	2.20765	WP Riggs - 58
Riggs	Archibald, J.C. & J. R. Paynter	2000	Assays, DD - 1 - 302m	2.20495	WP Riggs - 57
Riggs, Bryure	Arlington Resources Inc.	1998-1999	Assays, GC, GL, Samp, Pr	2.20001	WP Riggs - 55
Riggs	Clement, S.F.	1999	GL, Pr, Samp, Assays, GC	2.19672	WP Riggs - 50
Riggs	Longbow Exploration Inc./Watson Lake Mines Limited	1999	Assays, GL, Samp	2.19750	WP Riggs - 51
Riggs	Longbow Exploration Inc./Watson Lake Mines Limited	1999	Assays, GL, Samp, GC, Pr	2.20115	WP Riggs - 54
Riggs	Loydex Resources Inc./Nucanolan Resources Ltd.	1999	Assays, GL	2.20020	WP Riggs - 52
Riggs	Patricia Mining Corp.	1999	Assays, Samp, Tr	2.20150	WP Riggs - 53
Riggs	Pele Mountain Resources Inc.	2000	GM, VLFEM	2.20370	WP Riggs - 56

PROPERTY EXAMINATIONS

Tracanelli Occurrence, Riggs Township

Location and Regional Geology

The Tracanelli occurrence is located approximately 500 m north of the Riggs – Bruyere township boundary, in Riggs Township, mid-way between Albert and Little Brothers lakes. It is part of the Little Brothers Creek property that is 100% held by Patricia Mining Corp.

The property is accessible from the Goudreau – Lochalsh road via a disused logging road. This logging road extends through Jacobson and Riggs townships, south of the Edwards Mine property. The Tracanelli occurrence is located approximately 15 km from the Edwards Mine bunkhouses along the #49 logging road.

Regionally, the area is underlain by a sequence of isoclinally folded metavolcanic rocks consisting of basaltic to andesitic, tholeiitic to calc-alkalic massive and pillowed flows (Srivastava and Bennett 1978). Pyroclastic units are rare within the mafic metavolcanic rocks. The only intermediate to felsic metavolcanic rocks found in the area outcrop south of Lochalsh Bay, 4 kilometres north of the property. Metagabbro and metadioritic sills and dikes are commonly found throughout Riggs Township, but because of the absence of crosscutting relationships, they are

difficult to differentiate from coarse-grained mafic metavolcanic flows. A single, large gabbroic unit has been mapped west of the Albert Lake Stock (late stage granitoid) in southern Riggs Township (Heather and Buck 1988).

Two north-northwest trending lineaments bound the property to the east and west. The north-east trending Emily Bay fault passes to the south of the property. The Emily Bay Deformation Zone is a 500 m wide, northeast-trending zone of ductile shearing associated with the Emily Bay fault. It is located on the eastern margin of the Albert Lake Stock (Heather and Buck 1988).

Property Geology and Mineralization

The property is underlain by massive and pillowed mafic metavolcanic rocks. With the exception of the rare pillowed sequences, it is difficult to distinguish individual flows. All rock units show moderate to strong carbonate alteration. The eastern portion of the property has been intruded by a coarse-grained gabbroic body. This gabbro has in turn been intruded by the Albert Lake Stock. The Albert Lake Stock is a 2 km in diameter, medium-grained, equigranular, trondhjemitic to granodioritic body that underlies the basin of Albert Lake.

The gabbro and the Albert Lake Stock appear to be two separate, unrelated intrusions. The late stage granodiorite has an obvious intrusive relationship to the gabbro.

The Tracanelli occurrence lies at the contact between the mafic metavolcanic rocks and the gabbro. Auriferous quartz-carbonate veins (up to 25 cm wide) occupy iron carbonate – sericite – silica shear zones that range from less than 1 metre up to 15 metres in width. Two prominent vein systems have been identified trending 110° and 150°. Pyrite (3-5%) and rare pyrrhotite are associated with the quartz veins and the shear zones.

The original discovery boulder contained visible gold and returned an assay of 1140 g/t gold. Chip and channel samples collected from the 150°-trending boudinaged quartz vein returned average values of 22.29 g/t gold over 2.0 metres and 41.44 g/t gold over 1 metre close to the site of the original discovery. Grab samples collected from this area containing visible gold, returned values as high as 166.61 g/t gold (Perkins 2000b). This vein has been exposed by trenching for approximately 80 metres along strike.

Approximately 50 metres to the west, three sub-parallel 110°-trending veins have been exposed within sheared mafic metavolcanic rocks displaying strong pyrite - carbonate – silica alteration. These veins have been exposed along strike for distances ranging from 60 to 150 metres. Grab samples collected from these veins ranged from 2.0 g/t gold to 11 g/t gold.

In 1998, Patricia Mining Corp. discovered two other gold occurrences in carbonate-altered shear zones within the gabbro. These occurrences, named the Mother's Day and Mother's Day South showings, are located approximately 1.2 km north of the Tracanelli occurrence. The Mother's Day showing is composed of a flat-lying to gently west dipping quartz vein system trending 240°. The quartz vein stockwork is composed of a 25-50 cm wide quartz vein, east-trending chloritic quartz-filled fractures and north-trending quartz-carbonate veins. The stockwork is enclosed in a zone of iron carbonate alteration. The highest gold assay (2.19g/t gold over 0.75 m) was obtained from a channel sample of carbonate-altered gabbro containing pyrite stringers. The Mother's Day South showing is composed of a 60 cm wide sheared quartz vein. Grab samples from this vein returned gold values as high as 1.3 g/t gold (Shore 1999).

To the east of the Little Brothers Creek property, a small gabbro body possibly related to the auriferous gabbro, occurs on the east side of the Albert Lake Stock, just north of the Emily Bay Mine patented claims (Srivastava and Bennett 1977). It was last explored in 1989 by Belmoral Mines Limited under the terms of a Canreos – Armistice Resources joint venture. Two grab samples collected from rusty gabbro, returned assays of 0.325% Ni and 243 ppb Pt and 0.129% Ni and 34 ppb Pt (Koch 1989). At the time of writing, this gabbro and at least one other small gabrroic body on the west shore of Dog Lake were open for staking.

GQ Occurrence, Musquash Township

Location and Regional Geology

The GQ occurrence is situated in the southwest corner of Musquash Township, approximately 15 kilometres north of the town of Wawa. It is accessible via a new forestry road that provides access to the west bank of the Magpie River. Musquash Township is one of 24 townships in the northern Algoma area administered by the Wagner Forest Management Group out of Sault Ste. Marie Ontario. Prior to 1996, these townships were owned and administered by Algoma Central Railway.

Regionally, Musquash Township is underlain by rocks of the Catfish Assemblage (2.7 Ga). The stratigraphy is dominated by massive and pillowed mafic metavolcanic rocks. Minor exposures of intermediate to felsic metavolcanic rocks have been observed in the southwest and northeast parts of the township. These rocks are chiefly tuff, lapilli tuff and rarely, breccia. The rock units trend northwesterly, dip 40° to 60° northeast and face southwest. The stratigraphy becomes increasingly recumbant and eventually forms the south limb of the Central Anticline centred, to the north, in Leclaire Township. Proterozoic diabase dikes cut all units. These dikes strike both northwest and northeast, with the northwest trend being the most prevalent. These dikes commonly occupy faults and shear zones. Musquash Township was last mapped by the Ontario Geological Survey in the late 1970's (Sage et al. 1981; Sage 1993a).

Property Geology and Mineralization

Diamonds were first discovered in outcrops and large "truck-sized" angular boulders of fragmental lamprophyre and brecciated material uncovered during construction of brand new logging roads in the township. All subsequent diamond discoveries on the property have been made in rocks mapped as heterolithic breccias containing lapilli-sized clasts or intermediate to felsic clasts ranging up to 20 cm in size. At present, the relationships between these breccias has not yet been established. It is most likely that the two units are gradational to each other. Poor outcrop exposure may preclude the establishment of precise relationships.

Several actinolite-rich, xenolith bearing lamprophyre dikes, similar to the dike found at the Sandor occurrence in Lalibert Township, have also been found on the GQ property. In most cases the contacts between these dikes and the breccia are clearly intrusive. In at least one instance, a raft of lamprophyre appears to be enclosed within an outcrop of heterolithic breccia.

Like all of the diamond occurrences in the western Michipicoten greenstone belt, all of the diamonds recovered from the GQ property are gem quality, and predominantly white, clear and transparent. Some coloured diamonds have been recovered. Two of the macrodiamonds and 16 microdiamonds recovered from the property are pink in colour. An additional 40 diamonds have been described as rose, amber, green or yellow (Band-Ore Resources Ltd., *press release*, January 15, 2001). At the time of writing, a total of 507 diamonds (including 26 macrodiamonds) had been recovered from 548.3 kg of bedrock samples from the 25 km^2 GQ property. An additional 522 diamonds, including 1 macrodiamond, had been recovered from 219.03 kg of diamond drill core from the GQ occurrence (Band-Ore Resources Ltd., *press releases*, February 10, 2000 to January 15, 2001).

Some outcrops of lapilli-sized breccia found on the GQ Property closely resemble the dike (MEN 107) observed along highway 17 in Menzies Township on the property of Spider Resources Inc. A 164.7 kg sample from this dike returned 81 microdiamonds, 11 macrodiamonds and 3 commercial diamonds (Thomas 1998). Since Menzies Township has not been mapped at a detailed scale, it is difficult to speculate on how large of a geographic area these heterolithic breccias occupy and their potential economic significance.

Prior to the discovery of diamonds on the property in late 1999, virtually no mineral exploration had been conducted over the township. The last exploration occurred in 1980, when Amax of Canada Ltd. explored the area for base

metals. The company completed a single diamond drill hole in the vicinity of Band-Ore's easternmost diamondiferous outcrop.

RECOMMENDATIONS FOR EXPLORATION

Exploration Targets in Esquega Township

Esquega Township is located approximately 12 km west of the town of Wawa in the southwest part of the Michipicoten Greenstone Belt. The southeast third of the township is occupied by the Whitefish Lake Batholith and the northeast quarter of the township is underlain by rocks of the Hawk Lake Granitic Complex. The remainder of the township is underlain by mafic, ultramafic and felsic metavolcanic rocks of the 2.89 Ga Hawk Assemblage.

The township hosts 21 known metallic mineral occurrences displaying a broad range of mineralization. These economic minerals are often accompanied by a complex array of associated elements such as mercury, bismuth and beryllium which suggests a complicated hydrothermal history of the underlying bedrock. Gold occurs in a series of shear-hosted quartz veins in the north central part of the township. Gold has also been documented in association with the Ruth and Kathleen Iron Ranges. Several volcanogenic massive sulphide and gold occurrences have been documented in the southwestern corner of the township and are spatially associated with the contact between the Hawk Lake Granitic Complex and the surrounding mafic metavolcanic rocks, as well as with the Sunrise Lake peridotite body. The Sunrise Lake peridotite is also host to two zones of Ni/Cu/PGE mineralization. Two grab samples of the peridotite have returned values of 8520 ppm Cu, 8700 ppm Ni and 390 ppb Pt, and 5220 ppm Cu, 8300 ppm Ni and 410 ppb Pt (Sage 1993b). Readers are directed to (Sage 1993b), Preliminary Map P.2440 (Sage et al. 1982) and the provincial Mineral Deposits Inventory database for additional information on these mineral occurrences.

Esquega Township also is a tantalizing target for diamond exploration. Portions of the township are underlain by stable, undeformed granodioritic and granitic intrusive rocks which are considered to be good kimberlite hosts. A major north-northeast trending lineament (the Wawa – Hawk Lake fault) lies roughly coincident with the granite – greenstone contact. This lineament is possibly the most westerly of several regional subparallel faults related to the Kapuskasing Structural Zone. The close proximity of the middle Proterozoic-aged Firesand River Carbonatite located at the junction between the Wawa – Hawk Lake and Firesand River faults also contributes to diamond potential in the area. Geographically, the township lies midway between a cluster of kimberlite occurrences in Isaac Township and the Clement alluvial diamond discovery in Lendrum Township

Examination of kimberlite pipe modelling (Keating correlation coefficients) for the Wawa airborne magnetic survey identifies 12 anomalies that are roughly coincident with the gold and base metal occurrences in the township. Although interesting, these anomalies may not be as promising as the three anomalies that lie close to the Wawa – Hawk Lake fault (Ontario Geological Survey 2000a). A diamond exploration program conducted by Plata-Peru Resources Inc. in 1998 also identified 3 other potential kimberlite targets in the township. The results of their program were inconclusive and additional till sampling, ground and airborne geophysical surveys and diamond drilling were recommended (Sears 1998).

Esquega Township is administered by Wagner Forest Management, based out of Sault Ste. Marie Ontario. At the time of writing, most of the land in Esquega Township was available for mineral exploration.

OGS ACTIVITIES AND RESEARCH BY OTHERS

The Ontario Geological Survey conducted a helicopter supported regional lake sediment and water geochemical survey of the Kabinakagami Lake area during the 2000 field season (Jackson 2000). This survey covered the western portion of the Kabinakagami Lake greenstone belt between Hornepayne and White River. This survey complements the lake sediment survey for the Foleyet – Missinaibi area, released in April 2000 (Ontario Geological Survey 2000b).

The Ontario Geological Survey has also undertaken a project to compile new bedrock geology maps for the Wawa area. These maps will integrate the most up-to-date bedrock mapping and new tectonic interpretations with updates to the Ontario Mineral Deposit Inventory database. Three new sheets will be produced at a scale of 1:250 000 and will cover the Hornepayne (NTS 42F), White River (NTS 42C) and Michipicoten (NTS 41N) areas. These maps are expected to be released intermittently during 2001. This project was funded by Operation Treasure Hunt (Santaguida 2000).

A modern alluvium sampling for indicator minerals program was conducted over the Kapuskasing Structural Zone this past summer. This Operation Treasure Hunt project involved medium density sampling (approximately 1 sample per 30 km^2) over an area of approximately 65 000 km^2. These samples will be processed for kimberlite indicator minerals, magmatic massive sulphide indicator minerals and gold grains. A staged release of the data is expected during 2001 (Dyer 2000a).

Fieldwork for a third Operation Treasure Hunt project was also begun in 2000. This project examines the bedrock aggregate potential of the north shore of Lake Superior. An Open File Report and a series of bedrock resource maps will be released for the area (Dyer 2000b).

ACKNOWLEDGEMENTS

Table 3 was compiled with the assistance of D. M. Draper and P. J. Hope. Information for Table 4 was compiled by P. J. Hope. G. W. Seim assisted with the completion of figure 1.

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Table 5. Mineral deposits not being mined in the Wawa Area in 2000.

Abbreviations

AF	Assessment Files	MLS	Mining Lands, Sudbury
CMH	Canadian Mines Handbook	MR	Mining Recorder
GR	Geological Report	NM	The Northern Miner
MDC	Mineral Deposit Circular	OFR	Open File Report
MDIR	Mineral Deposit Inventory record	PC	Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Alden-Goudreau (past producer) Cowie Township	Au	170 000 tons @ 0.50 oz/t Au	Algoma Central Railway	CMH 1937-43	Inactive
Braminco Prospect Brackin Township	Au	100 000 T @0.15 opT (#21 Vein); 23 000 T @ 0.31 opT (#7 Vein); 5000 T @ 0.26 opT (B Vein)	Conquest Yellowknife Resources Ltd.	RGF	Inactive
Cline - Pick Gold Mine (past producer) Jacobson Township	Au	20 000 tons @ 19.5 g/t Au in No. 3 shaft area	Cline Mining Corporation.	RGF	Inactive
Ego Mines Claims Abotossaway Township	Au, Cu	7 mineralized zones; W-8 zone hosts 442 080 tonnes @ 2.6 g/t Au, 1.91% Cu	N. A.	OFR 5587	Inactive
Goudreau Zone Finan Township	Au	198 000 tonnes @ 8.4 g/t Au	Patricia Mining Corp.	RGF	Active exploration 1997
Kremzar Mine (past producer) Finan Township	Au	229 777 tonnes @ 7.65 g/t Au	Patricia Mining Corp.	RGF	Active exploration 2000
Lakemount Property Esquega Townships	Ni, Cu	2 500 000 tons @ 0.55% Ni 0.36% Cu	N. A.	OFR 5798	Last active 1980
Lochalsh Deposit (Island Gold Project) Finan Township	Au	883 000 tonnes @ 6.5 g/t Au includes 148 000 tonnes @ 5.34 g/t Au (measured), 260 000 tonnes @ 6.95 g/t Au (indicated); 475 000 tonnes@ 6.61 g/t Au (inferred)	Patricia Mining Corp.	RGF	Underground ramp to 140 m. Active exploration 2000
Magino Mine (past producer) Finan Township	Au	24 million tonnes @ 1.68 g/t Au. Past producer 1988-92, 101 948 oz	Golden Goose Resources Inc.	RGF	Active. Heap leach study 1999. Diamond drilling, 19 holes (4040 ft) 2000
Magnacon Mine (past producer) Michibishu Lake Area	Au	1.47 million tons aver. 0.19 oz/t Au (drill indicated). Past producer 1990, 19 397 oz from 163 366 tons	Windarra Group of companies 25%/River Gold Mines Ltd. 75%	CMH, 1997-98, p. 204	River Gold Mines Ltd. acquires 75% interest in properties in 2000. Will spend $2 million in 4 years.

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Markes Occurrence Jacobson Township	Au	65 000 tonnes @ 5.75 g/t Au	Pele Mountain Resources Inc.	RGF	Active. Diamond drilling 1990. Bulk sampled 1999.
Moki Main Zone Mishibishu Lake Area	Au	1 424 000 tonnes@ 4.24 g/t Au; open pittable reserve 772 000 tonnes@ 3.31 g/t Au to 56 m; U/G reserves 652 000 tones @ 5.38 g/t Au	River Gold Mines Ltd.	CMH, 2000-2001, p.341	Last active exploration 1997. Development planned 2001.
Murphy-Algold-Ambers Gold Mine (past-producer) Abotossaway Township	Au	248 800 tons @ 0.305 oz/t Au	N. A.	RGF	Inactive
Nodulama Prospect Leroux Township	Au	579 325 T @ 0.194 opT Au	Conquest Resources Ltd.	RGF	Inactive
No. 8 Zone Foran Township	Au	90 700 tonnes @ 6.9 g/t Au	Patricia Mining Corp.	RGF	Exploration 1997
Pine Zone Foran Township	Au	70 000 tonnes @ 6.4 g/t Au	Patricia Mining Corp.	RGF	Inactive
Renabie Mine (past producer) Leroux Township	Au	1 million tonnes @0.2 g/t Au. Past producer 1,100,000 oz Au, closed 1991	To be returned to Crown in 2001	RGF	Rehabilitated
Shenango Gold Mine Hawkins Township	Au	37 440 tonnes @ 4.3 g/t Au	D. McKinnon	RGF	Inactive
Sugar Zone Hambleton and Odlum Townships	Au	692 000 tonnes @ 6.9 g/t Au (inferred resource)	Harte Resoureces Corporation – Corona Gold Corporation J. V.	March 23, 1999 press release	53 ddh (9957m), stripping, trenching in 1998-99
Surluga Mine (past producer) McMurray Township	Au	385 000 tons @ 0.21 opT Au. Past producer 1989, 4921 oz Au & 383 oz Ag	Citadel Gold Mines Inc.	NM, March 5, 1990	Care and maintenance. Property optioned to Tri-Origin Exploration Ltd. 2000.

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Timmins Regional Resident Geologist
(Sault Ste. Marie District)--2000

by

M. Hailstone, B.T. Atkinson and D. Farrow

2001

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TIMMINS REGIONAL RESIDENT GEOLOGIST SAULT STE. MARIE DISTRICT – 2000

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INTRODUCTION

Primary mineral production from the Sault Ste. Marie district during 2000 comprised bedrock aggregate from 5 quarries. A total of 13 individuals and companies are known to have conducted mineral exploration and prospecting programs in the district during the year. Copper and precious metals mineralization hosted in rocks of Keweenawan age were the major focus of exploration in 2000. Other exploration targets included platinum group metals, diamonds, gold, base metals and dimension stone. Reflecting recent commodity trends, gold was the primary objective in only one project. Details on exploration activity can be found in the text and by reference to Table 1 and Figure 1.

Production of sand and gravel aggregate for the year includes 791,847 tonnes from 73 Licenses and 389,679 tonnes from 141 Permits, totalling 1 181 526 tonnes (Ontario Aggregate Resource Corporation, 2001). These figures do not include bedrock aggregate quarries discussed in the Quarrying Activity section of this report.

QUARRYING ACTIVITY

Production continued from five established bedrock quarries in the Sault St. Marie District. The quarries are keyed with letters in parentheses to Figure 1.

Nestorville Quarry

The Nestorville Quarry (A) is located near the Town of Nestorville, 4 km west of the Town of Thessalon. Crushed Nipissing diabase is produced for a number of uses, chiefly rail ballast and quality construction aggregate used in fabricating high-strength concrete. (R. Gardner, pers. com., 2001).

Ontario Trap Rock (A Division of R.W. Tomlinson Limited)

Ontario Trap Rock (B) continued quarrying a crushed bedrock aggregate from Nipissing diabase at their site 3 km east of the Town of Bruce Mines. R. W. Tomlinson Limited produces high quality aggregate for the construction industry.

The operating season begins in March and normally ends in November, employing 25 people on a seasonal basis. About 90% of the aggregate is transported by ship from Ontario Trap Rock's deep-water port on

Lake Huron, with the remaining product going by rail and truck. Lower than normal lake water levels during the 2000 shipping season resulted in higher shipping costs due to smaller shipments. Production and sales during the year were governed by market demand. The quarry has an estimated $2 million impact on the area economy. (J. Forbes, Ontario Trap Rock, pers. com., 2001).

Root River Sandstone Quarry

Root River Sandstone Quarry (C) operated by E. Kosiba is located within the city limits of Sault Ste Marie. The quarry produces an attractive red flagstone from Jacobsville sandstone, which is used mostly for stone facing, retaining walls and landscaping. Production increased slightly this year with a total of 95.5 tonnes extracted during 2000. (E. Kosiba, pers. com., 2001).

Gilbertson Enterprises Quarry

Gilbertson Enterprises (D) of St. Joseph Island operates a quarry east of Highway 548 and south of Highway 17. The quarried rock is a reddish-pink to grey granophyre, a late differentiate typical of Bruce Mines type Nipissing diabase. Several sizes of aggregate and landscaping products are obtained from crushing and screening operations. Production increased in 2000 in response to local demand for paving aggregate. Deliveries in 2000 were drawn from stockpiles and additional quarrying. (S. Eddy, pers. com., 2001).

Rancourt Quarry

The Rancourt Quarry (E) is located approximately 41 km north of the Town of Thessalon in Gould Township. Quarrying operations commenced in 1999, producing approximately 200 tonnes of black argillite for use in the construction of fireplaces, walkways, outdoor stairs and patios. Marketing promotion carried out in southern Ontario during 2000 is expected to have a positive effect on product demand in 2001. (R. Bertolo, pers. com., 2001).

EXPLORATION ACTIVITY

A summary of 2000 Exploration Activities is produced in Table 1.

Falconbridge Limited

Falconbridge Limited carried out a regional reconnaissance investigation for Keweenawan copper-precious metal mineralization north and east of Sault Ste. Marie. At the Island Copper occurrence, Falconbridge completed linecutting, geological mapping and ground geophysics, including induced polarization and gravity profile surveys.

Falconbridge holds 64 claim units along the border of Archibald and Tupper townships, approximately 4 kilometers north-west of the Wolfe Lake copper occurrence. The company also holds 47 claim units in Norberg and Nicolet townships which includes the East Breccia zone initially delineated in 1962 by Tribag Mining Co. Limited. (Mike Collinson, Falconbridge Limited, pers. com., 2000).

Phelps Dodge Corporation of Canada, Limited

In December 2000, Phelps Dodge Canada staked 192 claim units in Plummer Additional Township for copper - precious metal mineralization exploration.

The company also holds 10 claim units in Vankoughnet Township adjoining the Eagle Copper prospect, located on patented land in the SW 1/4 of Section 14 Vankoughnet Township. The Eagle was developed on chalcopyrite and bornite rich veins up to 3 1/2 feet wide. Galena veins and gold bearing quartz veins are spatially associated with a graphitic unit (District Geologist Office, Assessment Files Sault Ste. Marie, M. Johnson, pers. com., 2000).

Table 1. Exploration activity in the Sault Ste. Marie District in 2000.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
DD ..... Diamond drilling
GL ..... Geological survey
GM ..... Ground magnetic survey
KIM ..... Kimberlite indicator mineral sampling
Lc ..... Linecutting
OPAP ..... Ontario Prospectors Assistance Program
Pr ..... Prospecting
Samp ..... Sampling (other than bulk)
Str ..... Stripping
Tr ..... Trenching

No.	Company/Individual (Occurrence Name) or Property	Township/Area (Commodity)	Exploration Activity (Incentive Program)
1	Barry, R.	Otter Twp. (Cu, Au, Bi)	Pr, Tr, Samp
2	Canabrava Diamond Corporation / Paramount Ventures and Finance Inc. & Kennecott Canada Exploration Inc.	Several townships (Diamond)	KIM
3	Doran, F.	Kincaid Twp. (Cu, Ag, Au)	Pr, Samp
4	Falconbridge Limited	Aweres, Nicolet, Norberg Twps. (Cu, Ag, Au)	P, GL, Samp
5	Frankow, P.	Neill, Moggy Twps. (Au, Zn, Cu)	GL, Samp, Pr
6	Lucuik, G. & Hicks, C.	Vankoughnet Twp. (Ag, Pb, Au)	Pr, Samp
7	O'Connor, T.	Kincaid, Ryan Twps. (Stone)	Pr, Tr
8	Phelps Dodge Corp. Can. Ltd.	Vankoughnet, Plummer Additional Twps. (Cu, Pb, Zn, Ag, Au)	GL, Pr, Samp
9	Porcheron, A.	Nicolet Twp. (Cu, Ag, Au)	Pr, Samp
10	Tremblay, M. & Robert, J.	Moen Twp. (Au, BM)	Pr, Samp, Str
11	Walmsley, J.	Casson Twp. (Cu, Ag, Au)	Pr, Samp
12	Pipoli, D. & Ralph, J.	Wishart Twp. (Au)	Str, Samp
13	Pruneau, J.	Jollineau Twp. (Ce, Li, Rb, Ta)	Pr, Samp

Canabrava Diamond Corporation/Paramount Ventures and Finance Inc. and Kennecott Canada Rocky Island Lake Project

Canabrava Diamond Corporation and joint venture partner Paramount Ventures & Finance Inc. completed an extensive reconnaissance till sampling program for diamonds and kimberlite indicator minerals over an area covering 130,000 square km, known as the Rocky Island Lake project. The companies subsequently signed an option/joint venture letter of agreement with Kennecott Canada Exploration Inc. Kennecott is committed to spend $1.5 million over 18 months before the companies enter into a formal joint venture agreement.

Kennecott's summer and fall exploration program focused on eleven high priority areas supplemented by additional regional reconnaissance sampling. In one of the areas a number of "kimberlitic" boulders were identified proximal to anomalous kimberlite indicator minerals. In another area, a well-defined indicator mineral plume containing abundant pyrope garnet, chrome diopside, chromite and olivine was tracked for 20 km up-ice. In these and other anomalous areas, follow-up work included till sampling along lines oriented perpendicular to ice direction, and localized high-density grid sampling. Initial binocular microscope examination revealed mineralogical and textural features consistent with kimberlite, and mantle-derived xenoliths have been identified in one of the samples. Further analysis is underway at Kennecott's Thunder Bay laboratory facility, with results expected in early 2001. (press release, Canabrava Diamond Corporation, 2000).

LAND USE PLANNING ACTIVITY

Staff of the Sault Ste. Marie District Geologist Office provided input to the Ontario Living Legacy review process for sites to be regulated in 2001 in Sault Ste. Marie, Sudbury, North Bay and Parry Sound. During 2000, staff consulted on boundary refinements for a total of 19 Ontario Living Legacy parks and conservation reserve sites within the Sault Ste. Marie district. These sites are proposed for regulation in 2001. The Mineral Resource Assessments for these locations are kept on file at the Sault Ste. Marie District Geologist Office.

During 2000, the Sault Ste. Marie District Geologist provided Ministry of Municipal Affairs and Housing personnel with additional comments on the Official Plan for the Corporation of the Township of the North Shore and the Official Plan for MacDonald, Meredith and Aberdeen Additional townships. Copies of maps and reports for Official Plans of municipalities within the District are kept on file at the Sault Ste. Marie District Geologist Office.

In February, staff prepared a review for each of 20 lakes proposed for cottage development in Elliot Lake. Mineral Resource Assessments, current mining/exploration activity and mineral deposits inventory sites were examined. These were reviewed by staff again in August and followed up with D. Farrow's attendance in December at the public consultation in Elliot Lake for 11 selected lakes with proposed cottage lot development. Copies of the Lake Management Plans will be kept on file for viewing at the Sault Ste. Marie District Geologist's Office.

Also during the year, staff reviewed 6 consents for the Ministry of Municipal Affairs and Housing within Day Township.

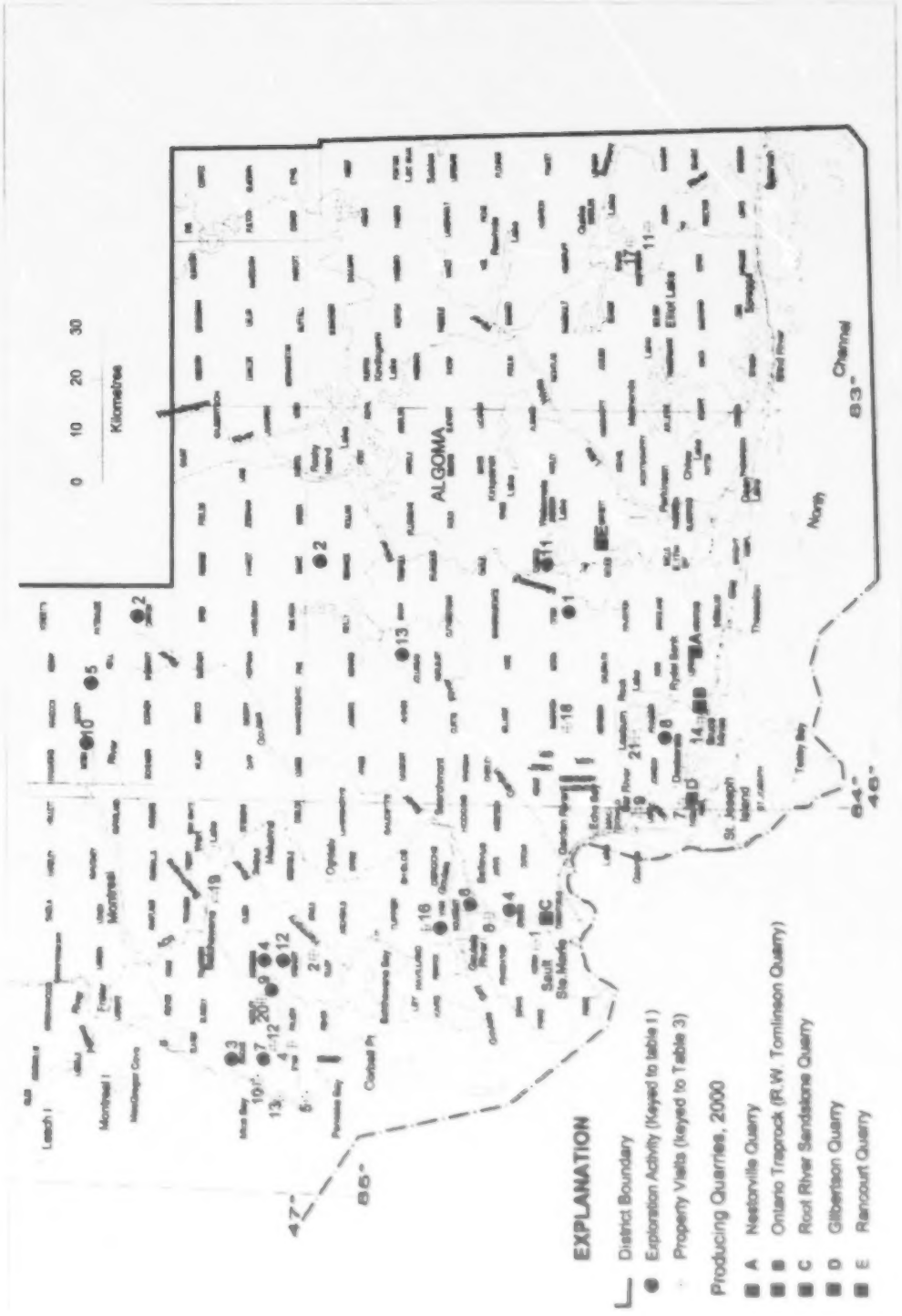

Figure 1. Exploration, property visits and quarries in the Sault Ste. Marie District in 2000.

Table 2. Assessment files received in the Sault Ste. Marie District Office in 2000.

Abbreviations

AEM ..... Airborne electromagnetic survey
AM ..... Airborne magnetic survey
ARA ..... Airborne radiometric survey
Beep ..... Beep Mat survey
Bulk ..... Bulk sampling
DD ..... Diamond drilling
DDH ..... Diamond drill hole(s)
DGP ..... Down-hole geophysics
EnvR ..... Environmental report
GC ..... Geochemical survey
GEM ..... Ground electromagnetic survey
GL ..... Geological survey
GM ..... Ground magnetic survey
GR ..... Geological report
GRA ..... Ground radiometric survey
Grav ..... Gravity survey
HLEM ..... Horizontal loop electromagnetic survey
HM ..... Heavy mineral sampling
IM ..... Industrial mineral testing and marketing
IP ..... Induced polarization survey
Lc ..... Linecutting
Met ..... Metallurgical testing
OD ..... Overburden drilling
ODH ..... Overburden drill hole(s)
OPAP ..... Ontario Prospectors Assistance Program
PEM ..... Pulse electromagnetic survey
PGM ..... Platinum group metals
Pr ..... Prospecting
RES ..... Resistivity survey
Samp ..... Sampling (other than bulk)
Seismic ..... Seismic survey
SP ..... Self-potential survey
Str ..... Stripping
Tr ..... Trenching
UG ..... Underground exploration/development
VLEM ..... Vertical loop electromagnetic survey
VLFEM ..... Very low frequency electromagnetic survey

Township	Company Name	Year	Type of Work	AFRO Number	Resident Geologist Office File Designation
Sturgeon, Rioux	Douglas, W.H.	1998	VLFEM, Lc, DD	2.19869	SSMP Sturgeon-03
McDonell	Gasparetto, A.	1999	GL, VLFEM, GM	2.19957	SSMP McDonell-06
Gunterman	Surmacz, S. and Hauseux, M.	1992	Pr, Samp	(OPAP)	OPAP Gunterman-06
Olsen	Fleming, T.	1998	Pr, Samp, Str	(OPAP)	OPAP Olsen-42
Otter	Bary, R.	1998	Pr, Samp, Str, Tr	(OPAP)	OPAP Otter-12
Palmer	Leahy, P.	1999/2000	Lc, GL	2.20406	Palmer-0039
Neill, Moggy	Frankow, P.	1998/2000	Pr, Samp	2.20375	SSMP Neill-19
Poncet	Morin, M.R.	1998/1999	Pr, Samp	2.20263	Poncet-0011
Gapp	Patrie, J.P.	1999	Pr, IP	2.20264	SSMP Gapp-16
Gaiashk, Joubin, Proctor, Gerow, Deagle	Falconbridge Ltd.	1991-1996	GL, GEM, DD	donated	SSMP Gaiashk-08

SAULT STE. MARIE DISTRICT STAFF AND ACTIVITIES

District Geologist M. Hailstone and District Support Geologist D. Farrow staff the Sault Ste. Marie office. Paul Morra retired from the District Support Geologist position in May. Technical assistance was provided by Joel Kell and Carolyn Marrack as experience students between May and August. Joel Kell also assisted as GA2 in a contract position between August and October. D. Farrow joined the Sault Ste. Marie office as District Support Geologist in late October. Paul Beach was engaged under contract between January and April to update the Mineral Deposits Inventory (MDI) database. A total of 681 records are now in the Sault Ste. Marie MDI database.

M. Hailstone participated in the Training and Development position of Regional Land Use Geologist in Sudbury until April 2000. C. Ravnaas participated in the Training and Development position of Sault Ste. Marie District Geologist until April 2000.

M. Hailstone participated in a week long Economic Development course offered through Waterloo University in April. Staff of the District Geologist Office carried out 21 field visits during the year (tabulated in Table 3). Staff provided 3 field trips to the area for research groups and industry.

C. Ravnaas attended the Prospectors and Developers Association of Canada convention in Toronto in March, assisting with the Northwestern and Northeastern Ontario regional displays. In April M. Hailstone attended the Northeastern Ontario Regional Symposium in Kirkland Lake, meeting with, and providing recommendations to, prospectors and other mining industry attendees. In September M. Hailstone attended the Resident Geologist's annual meeting in Acton and participated in field trips to industrial mineral producers in Southern Ontario.

The office received 795 visitors and responded to 2139 telephone calls during the year. The Drill Core storage facility was visited by 5 clients.

The Sault Ste. Marie District office initiated a program of providing daily industry press releases on mining, mineral exploration and development activity for the entire province. A total of 1082 press releases were distributed to the Ontario Geological Survey and the Resident Geologists Program for the year. The press releases averaged 90 per month and were summarized weekly for input to the weekly scan for mining, mineral development, mineral exploration activity and industry news. Press releases provide a valuable monitoring tool for tracking Ontario Treasure Hunt project funding as they provide an economic feedback to Ministry of Northern Development and Mines incentives programs. In many offices these press releases are available for viewing for information on mining, mineral exploration and mineral development activity in an area.

During September and October, approximately 350 abandoned mine sites (AMIS) were documented by Sonic Soil Sampling Inc., subcontracting to Aqua Terre Solutions Inc. The data collected from these sites are available from the Abandoned Mines Co-ordinator, Ministry of Northern Development and Mines, Sudbury.

M. Hailstone and C. Ravnaas attended meetings and telephone conferences as part of the Economic Development team and the Natural Resource Sector team. In October, M. Hailstone participated in the Intergovernmental Info Fair-"Quality Service" at the Holiday Inn in Sault Ste. Marie and attended the Economic Development team regional conference in Sault Ste. Marie. In September M. Hailstone attended presentations for the Great Lakes Heritage Coastline in Sault Ste. Marie, Blind River, Spanish and on St. Joseph Island.

Table 3. Property visits conducted by the Sault Ste. Marie District office 2000.

Number (keyed to Figure 1)	Property/Occurrence
1	Brandes Quarry (bedrock exposures on north side) – Tarentorus Twp.
2	Caputo Copper prospect – Wishart Twp.
3	Dog River Property, boulders of possible late archean actinolite clast bearing lamprophyre – West Twp. (Wawa)
4	Examination of Keweenawan outrcrops – Ryan Twp
5	Felsic intrusion – Ryan Twp.
6	Folson Lake PGE occurrence – Gerow Twp. (Sudbury)
7	Gilbertson Quarry – Tarbutt Additional Twp.
8	Island Copper prospect – Aweres Twp.
9	Jacobsville Lorraine quartzite contacts in the Echo Bay Area – Laird Twp.
10	Keweenawan outcrops from Mamainse point to Mica Bay – Ryan and Kincaid Twps.
11	Lower Livingston Creek outcrops – Joubin Twp.
12	Magnetic airborne anomaly – Ryan Twp.
13	Mamainse Mine – McDonell Location
14	Ontario Trap Rock Quarry – Plummer Additional Twp.
15	Outcrops of potentially diamondiferous rock – Musquash, and Menzies Twps. (Wawa)
16	Prace Mine – Vankoughnet Twp.
17	Stanleigh mine property – Gunterman Twp.
18	Stewart Lake area – McMahon Twp.
19	Syenite – Tolsen Twp.
20	Tribag Mine and East Breccia Zone – Nicolet Twp.
21	Upper Lorraine quartzite redbeds – Plummer Aberdeen and Johnson Twps.

Property and Field Examinations

Major authorship for the following property visits is indicated in parentheses following the title.

The figures (excepting figure 2.) were created with Esri arcview 3.0 using digital OGS products:OGS Geology of Ontario 1:1 million base; OGS Airborne geophysics at 1:20,000 for Batchawana greenstone belt; OGS Miscellaneous Data Release Ontario Drillhole Database MDR 13. Mineral Deposits Inventory Records Database (MDIR 1 database).

Unless otherwise stated references are related to Sault Ste. Marie District Geologist Office technical and assessment files.

Caputo Copper Occurrence (Tilley Lake Copper Occurrence) Wishart Township (B. Atkinson)

Location:

N. Pipoli holds 2 claims comprising 6 units in east central Wishart Township (formerly TP 27, R 12) that host a copper occurrence. Access to the property is by gravel logging road (Mile 38 Road) that leads northward from Hwy 17, approximately 1 km north of Chippewa Falls, about 60 km north of Sault Ste. Marie. Active logging operations were underway during the property visit and a newly constructed logging access road passes through the claim group.

Previous Work:

A. McDonald did prospecting and VLF-EM surveys in the area in 1992.

INCO and Lloydex Resources Ltd. performed geological, geophysical and geochemical surveys over a large block of claims in the central part of the township in 1990. Two drill holes were completed in the west part of the claims.

In 1988, Lacana Minerals Ltd. flew airborne magnetic and electromagnetic surveys over the area.

Corona Corporation completed geological surveys and grab sampling in 1988. Only low gold values were reported.

An airborne geophysical survey was flown over the Batchawana greenstone belt by the Ontario Geological Survey in 1989.

Quaternary Geology:

The area is mantled with glacial till and glaciofluvial deposits varying from less than 1 metre up to several metres in thickness. Large-scale cross-bedding and well-sorted and graded bedding in glaciofluvial deposits are present in material presently being exploited for road building. Glacial striations trending at 210^0 are abundant. Glacial till is dark coloured and has a high silt and clay content.

Bedrock Geology:

The property is underlain by felsic intrusive rocks of the Algoma batholith, which is prominent south of the Batchawana greenstone belt.

A northwest trending, fine- to medium-grained mafic dike intrudes the granodiorite and is sheared and mineralized with quartz and calcite veining. Copper mineralization associated with the shearing and veining includes bornite, chalcocite and chalcopyrite. Malachite staining is common. Hematite is present as pink colouring and as black slickensides on slip faces adjacent to copper mineralization. The mafic dike is generally medium- to fine-grained and consists predominantly of amphibole with minor olivine and plagioclase. It is generally melanocratic, very dark green to black in colour, crystalline and moderately hard. Rarely, it carries disseminated pyrite that is not associated with the veining and shearing. Prominent joint sets give the dike a blocky character. An adit has been excavated on the side of a ridge outcrop to a depth of about 15 metres. A pit below the adit portal exposes copper mineralization similar to that visible in the adit and in trenching immediately above the adit on the ridge crest. Veining exposed in the adit is narrow and deformed, exhibiting pinching and swelling features. On the crest of the ridge, bedrock trenches trend 290^0 and follow the mineralization for a distance of 50 meters.

A second area of trenching occurs approximately 100m to the northwest, where a large exposure of outcrop has been blasted and reportedly test mined. In this area, the contact between the diabase and granodiorite country rock is exposed. The contact is sharp and dips steeply to the west. Outcrops of medium- to coarse-

grained granodiorite occur to the north of the trenched area. An intrusive contact between granodiorite and the diabase dike can be seen in a small, northerly flowing creek. Here the dike dips 50^0 to the southwest. Due to lack of outcrop exposures, only the west contact of the dike was seen, hence its width could not be determined.

Samples:

Sample 2000-BTA-17 was collected for multi-element analysis. It is a character specimen of the mineralized zone from the trenched area of the dike and carries malachite and up to 5% sulphides, including bornite, chalcocite, chalcopyrite.

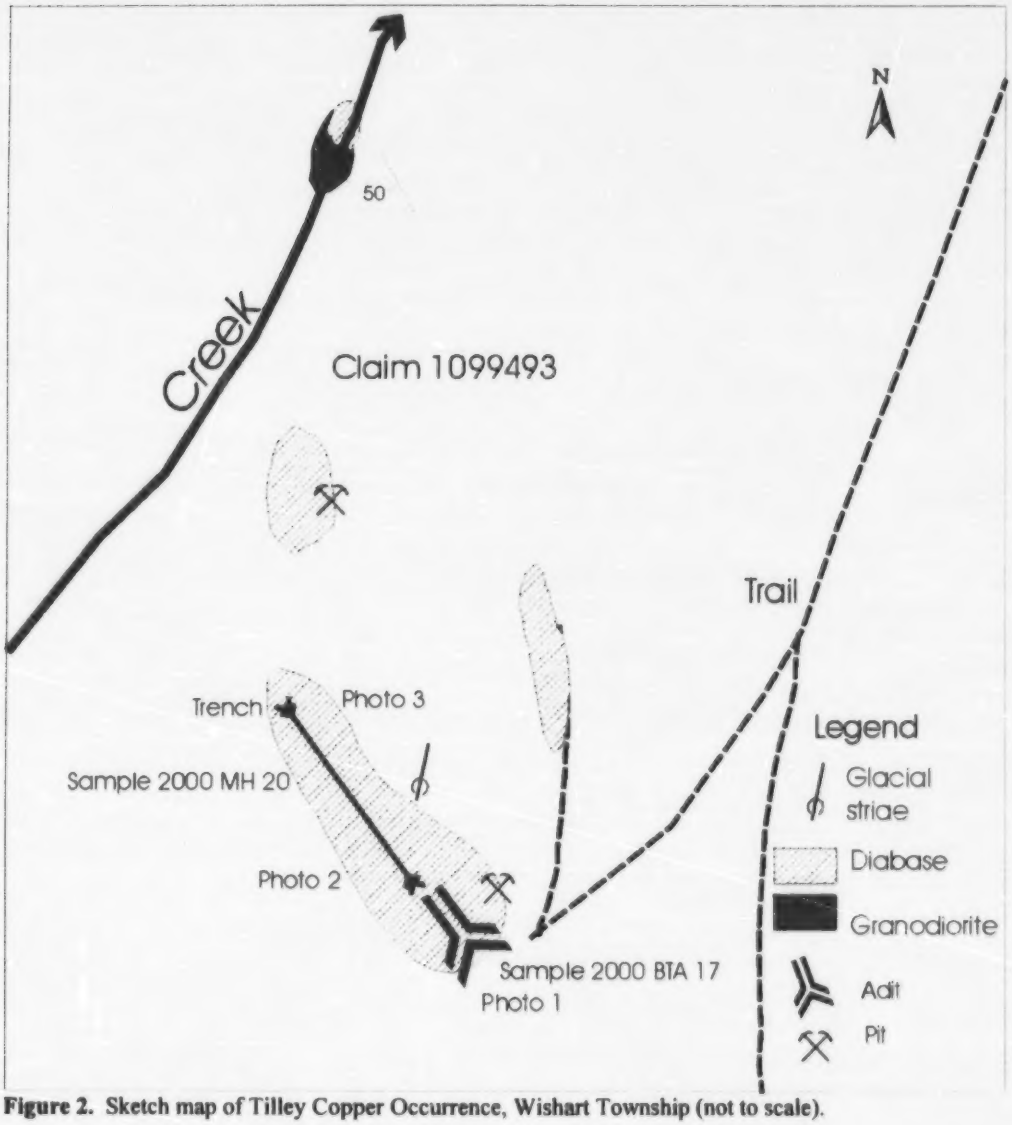

Figure 2. Sketch map of Tilley Copper Occurrence, Wishart Township (not to scale).

Discussion:

The dike may be of Keweenawan age, as evidenced by its relatively fine-grained nature, hematitic alteration and similarity of mineralization to other Keweenawan dike hosted copper occurrences.

Regional Magnetic Anomaly in Kincaid and Ryan Townships (M. Hailstone)

A regional magnetic anomaly in Kincaid and Ryan townships was investigated during the summer. The area is accessible via a 4 km logging road from Highway 17 approximately 65 km north of Sault Ste. Marie. The regional magnetic anomaly is coincident with intercalated Keweenawan mafic and felsic pyroclastic flows located on the margin of the Keweenawan rift.

Geology:

P.E. Giblin (1973) described the geology of the area. Regionally, the Keweenawan mafic flows strike north-northwest and dip 30° to 35° to the southwest. They are intercalated with felsic pyroclastic rocks and laminated felsic flows in two horizons separated by a continuous horizon of Keweenawan conglomerate rocks. The most westerly felsic horizon is exposed between the Mamainse Mine and Pancake Point. The easterly horizon is exposed between the southeast corner of Ryan Township and the mid-point of the southern boundary of the McDonell Location (an area comprising patented surface rights in northwestern Ryan and southwestern Kincaid townships).

The regional magnetic anomaly is coincident with the north end of the eastern belt of felsic pyroclastic and laminated flows. The west side of the regional anomaly is bounded by heterolithic conglomerate, a distinctive unit mapped over widths averaging 1km and striking north-northwest through the entire section of the Keweenawan flows exposed between Batchawana Bay and Mica Bay. The unit also marks a geomagnetic reversal from predominantly reversed polarized flows east of the conglomerate to normally polarized flows west of the conglomerate horizon (Annells, 1973).

P.E. Giblin (1969) documented magnetic attraction of felsic units on his 1 inch to 1/4 mile mapping. In the field, the writer observed a late, 3 m wide mafic (magnetic) dyke cutting the felsic pyroclastic rocks in the area.

Alteration:

The road into the area traverses the variously described rock types across strike. Near the west side of the regional magnetic anomaly, lower conglomerate beds intercalated with mafic flows are pervasively epdotized. Clasts of felsic material within the conglomerate have also been altered in some cases to friable sericite. Outcrops of felsic pyroclastic rocks within the core of the regional anomaly are pervasively hematized. Outcrops of mafic volcanic rocks located 3 km northwest of the anomaly along the south side of highway 17 exhibit pervasive hematization. This alteration has enhanced a sequence of pillowed flow to pillow breccia primary structures, indicating stratigraphic tops are to the southwest.

Previous work:

The only documented previous work in the area is geological mapping by Franc Joubin and associates to evaluate Keweenawan felsic rocks for their kaolin potential in 1962 (assessment files, Sault Ste Marie District Geologist office). Geological mapping at 1 inch to 1000 feet describes altered felsite and feldspathized basalt breccia in the area of the regional magnetic anomaly.

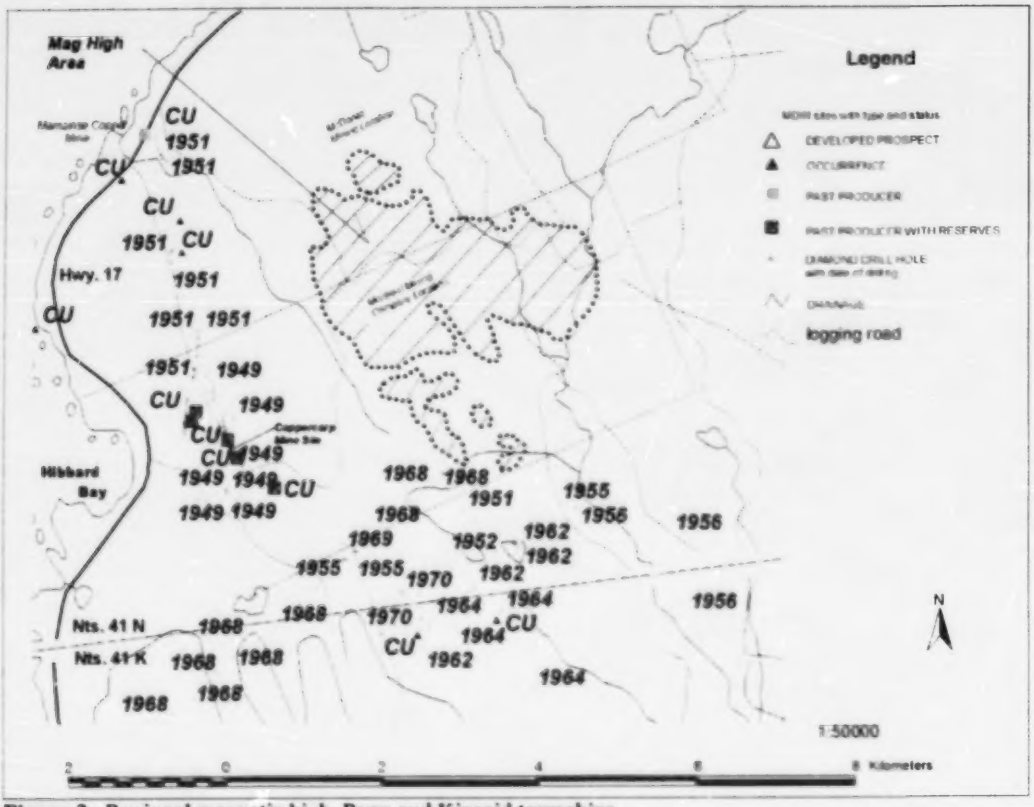

Figure 3. Regional magnetic high, Ryan and Kincaid townships.

Copper - Gold in Huronian Sediments (M.Hailstone)

Background and Geology:

D. Tortosa (1984) conducted a sampling program of heavy mineral beds, pebble conglomeratic facies and red beds within the Lorrain Formation for multi-element analysis. The results show anomalous gold concentrations in heavy mineral beds from both the Bruce Mines and Whitefish Falls areas. The sample data were appended to the report (available for viewing only at the Science Library, Laurentian University in Sudbury), and were recently provided to the writer by D. Tortosa. These data were entered into an Arcview GIS, enabling graphic display of sample site locations and results in conjunction with known mineral occurrences from MNDM's Mineral Deposits Inventory (MDI) and Ontario Diamond Drill Hole database (OGS 1997). UTM coordinates for each of Tortosa's sample sites and the analytical values obtained for each site are available for viewing at the office of the District Geologist, Sault Ste. Marie.

Tortosa's sampling focused on rocks of the Lorrain and Gordon Lake formations. "The main objectives of the project were to: a) analyse and interpret trace element data from the Lorrain Formation in terms of regional variations, stratigraphic control and relationship to easily recognizable lithological characteristics such as heavy mineral and pebble beds; b) to evaluate the trace element variations across the Lorrain-Gordon Lake Formation boundary and compare them with geochemical data from a known area of copper mineralization at Stag Lake; and c) to delineate any anomalous concentrations of trace metals, particularly gold and copper, which might provide target areas for follow-up." (Tortosa, 1984).

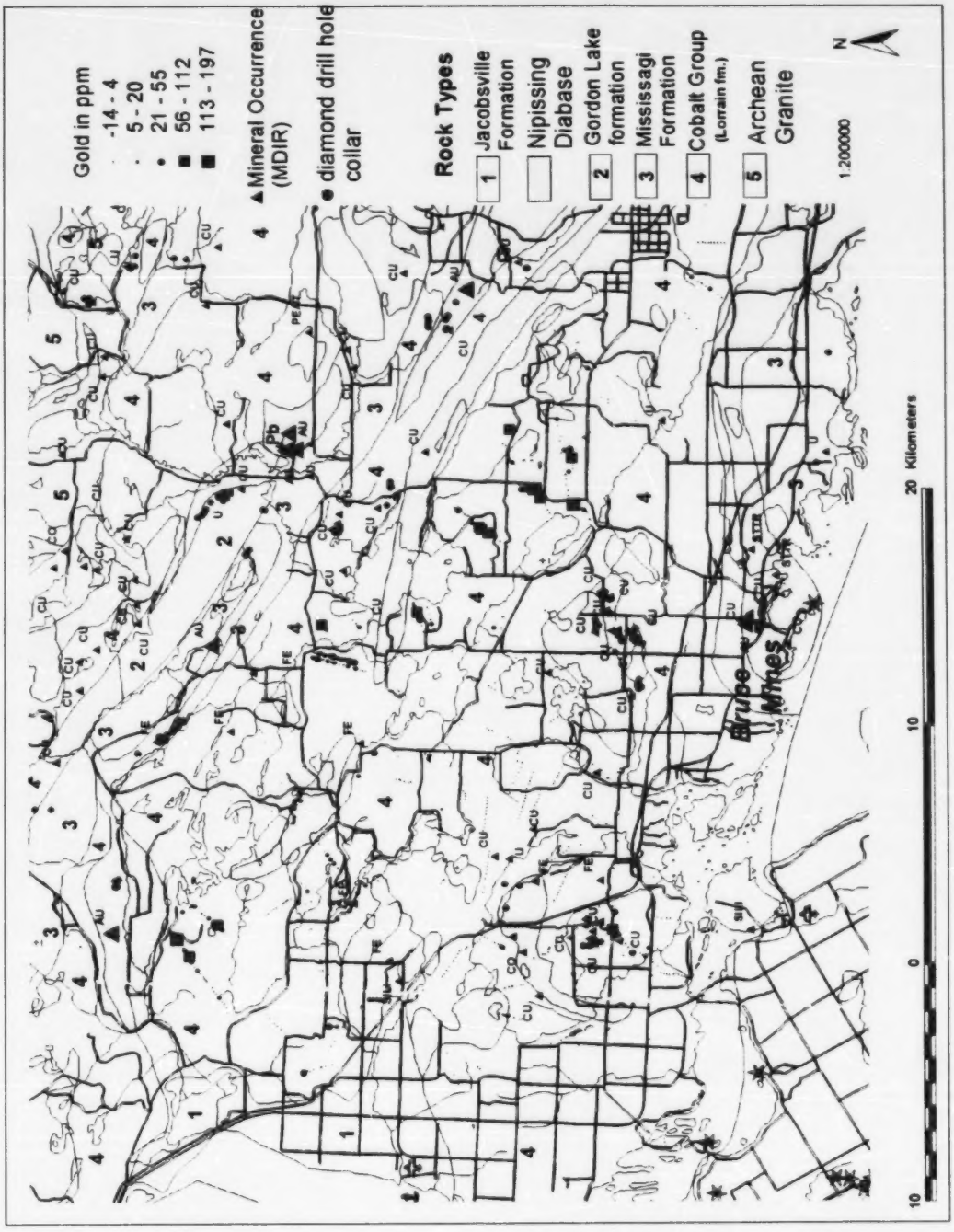

Figure 4. Gold in heavy mineral beds within the Lorrain and Gordon Lake formations - Bruce Mines area modified after Totosa (1984).

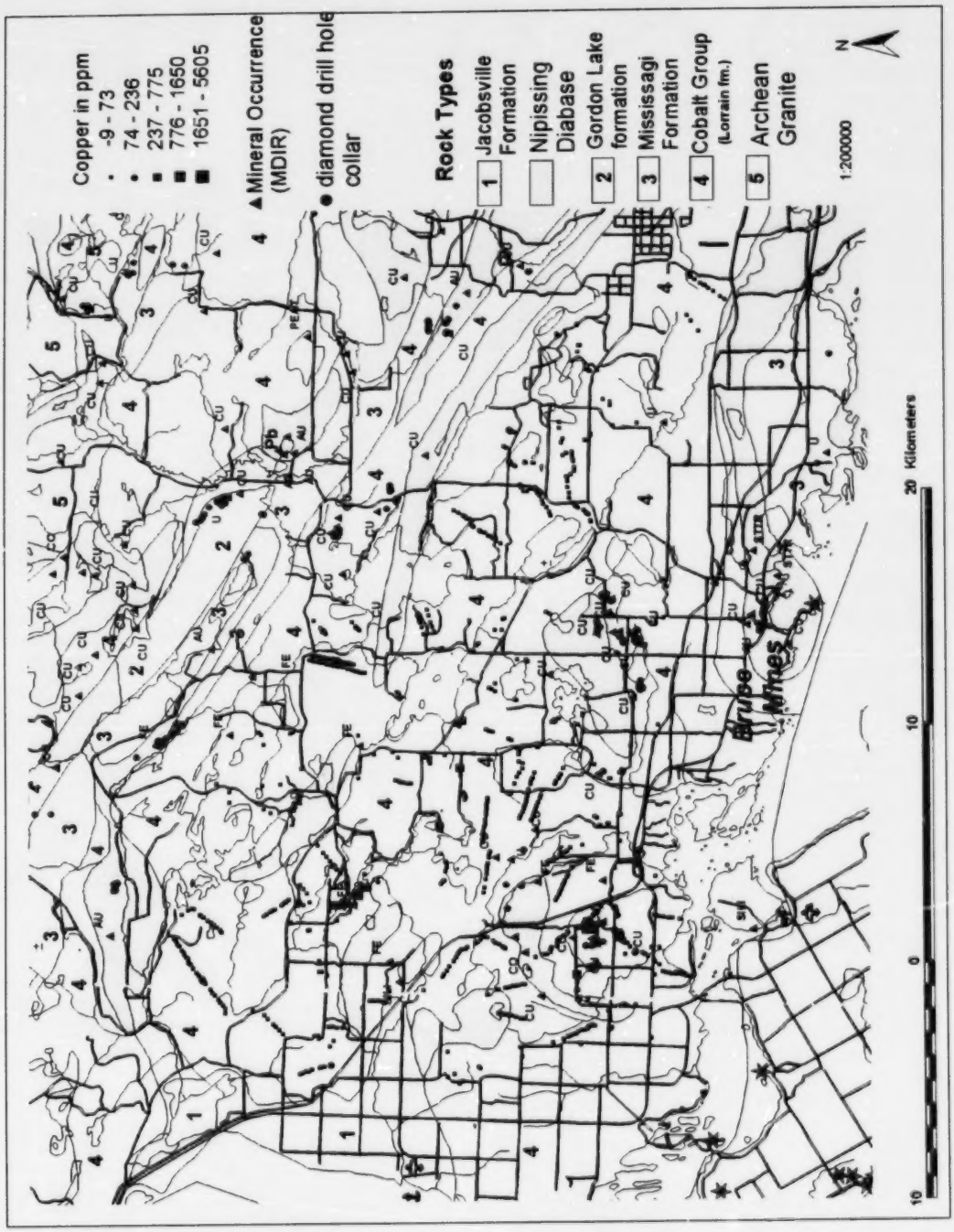

Figure 5. Copper in heavy mineral beds within the Lorrain and Gordon Lake formations - Bruce Mines area modified after Totosa (1984).

Alteration:

Samples were collected from outcrops located on the south side of the northwest trending Echo Lake structure referred to by Tortosa as a homocline (Tortosa, 1984). Figure 4. shows several hydrothermal vein hosted gold occurrences associated with the Echo Lake structure, which appears to have controlled emplacement of Nipissing diabase intrusive rocks. A number of authors, including Clemmey (1981), Clemmey and Badham (1982), Long (1981), Mossman and Harron (1983), Long and Loyd (1983) and Meyer (1983) have suggested that diagenetic or metamorphic modification or remobilization of paleo-placers may be an important mechanism for reconcentrating gold in Huronian sediments. Hematite-rich layers in the Lorrain Formation may represent diagenetic alteration products of magnetite-ilmenite placers. Ubiquitous and pervasive sericitization in the upper beds of the Lorrain Formation also suggest alteration.

While examining outcrops in the field with Tortosa, the writer observed no evidence of fine graphitic laminae or cracks within the rocks associated with anomalous gold values. By contrast it is interesting to note that these graphitic features are observed in uraniferous quartz pebble conglomerate outcrops exposed along Spine Road, in a floater reef overlying the main ore horizons of the Matinenda Formation along the south shore of Elliot Lake. These Spine Road outcrops are also anomalous in gold, assaying up to 0.02 ounces gold per ton (Bennett, 1982).

Dimension Stone - Tronsen Township (M. Hailstone)

Location and Access:

The area can be reached via an all weather road leaving Highway 17 approximately 400 meters north of Chippewa Falls in a northwesterly direction. Current logging roads provide local access (see Figure 6.).

Previous work:

There is no indication of previous work in this area for dimension stone. During the period 1960-65, Algoma Central examined airborne conductors with ground electromagnetic and magnetic surveys and no further work was done.

Geology:

G.M. Siragusa (1983 and 1984) described the geology of Tronsen Township. In the southeast corner of Tronsen Township and southwest corner of Vibert Township a large Archean felsic intrusion cuts metasedimentary rocks intercalated with felsic flows. Syenite observed in outcrop approximately 3.5 km south of Batchawana Station is not shown on existing geological maps of the area.

The syenite is porphyrytic and weathers to a reddish tan brown, offset with light tan, weathered calcic plagioclase phenocrysts averaging 1.5 to 2 cm in diameter. Deeply weathered boulders were plentiful, but only one outcropping was located for a fresh sample. The outcrop of syenite strikes north over a distance of 100 meters and is approximately 5 meters wide with a westerly dip of 80 degrees. On a fresh surface magnetite can be seen in some of the plagioclase phenocryst cores. The rock has an overall deep reddish-brown colour.

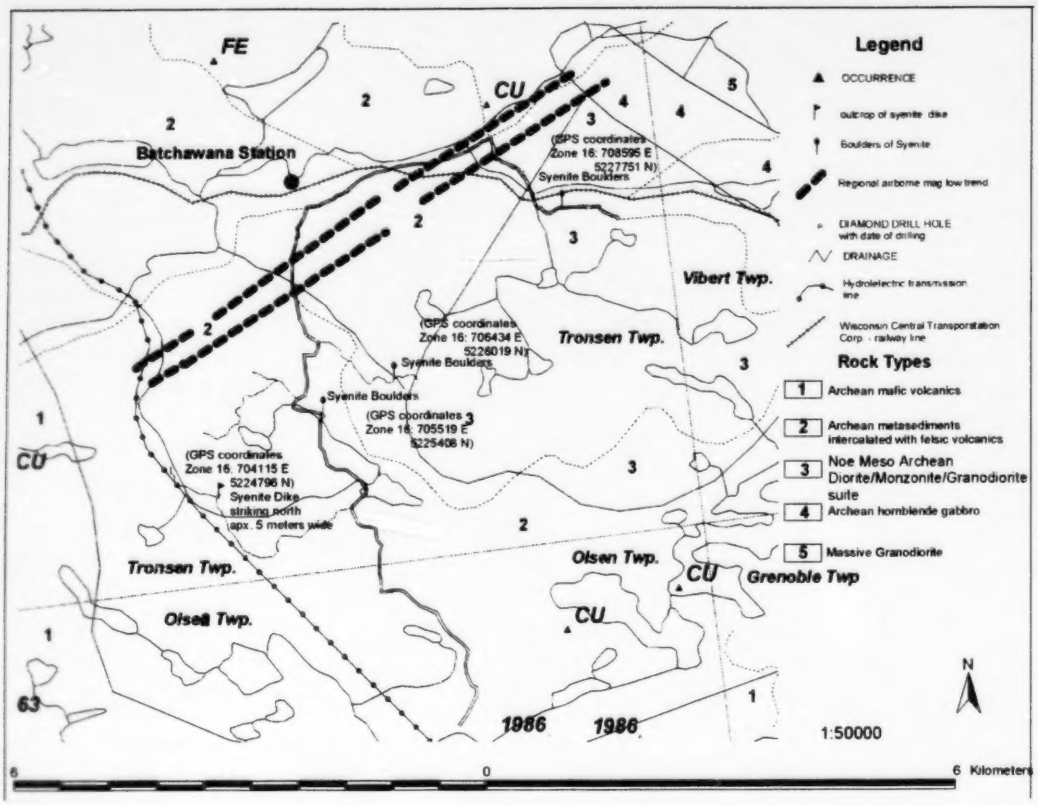

Figure 6. Location of syenite outcrops and boulder concentrations in Tronsen Township.

Discussion:

The single outcrop of syenite observed in the field does not warrant quarrying without further evaluation. The outcrop, in combination with the boulder accumulations and trains of syenite, may be an indication that a larger syenite body is present in the area.

Lower Livingstone Creek Formation – Joubin Township (M. Hailstone)

C. Ravnaas and P. Morra sampled two outcrops of Livingstone Creek Formation for multielement analysis and in particular paleoplacer gold as described in Ravnaas (2000). Although values were not encouraging the sampling helps to illustrate that a paleo source area for gold may simply have not been present in the Elliot Lake area to form deposits of strtiform gold mineralization. The area can be accessed from Highway 108, approximately 7 km south of Elliot Lake. The outcrops are located 200 m north of Pecors Road and 100 m south of Pecors Lake. East of Highway 108 the Nordic Road connects to the Pecors Road. The distance to the outcrops is approximately 13 km east from Highway 108.

Livingstone Creek Formation conglomerate outcroppings have now been traced over a distance of 5.2 kilometers. This unit marks the boundary between underlying Archean mafic to felsic volcanic rocks and later Proterozoic sedimentary rocks of the Huronian Supergroup. The Livingstone Creek conglomerate represents the earliest Proterozoic sedimentary rock. It is worth pointing out that the overlying early Proterozoic Huronian volcanic rocks are described by Bennett, et al., (1997) as being separated by an unconformity.

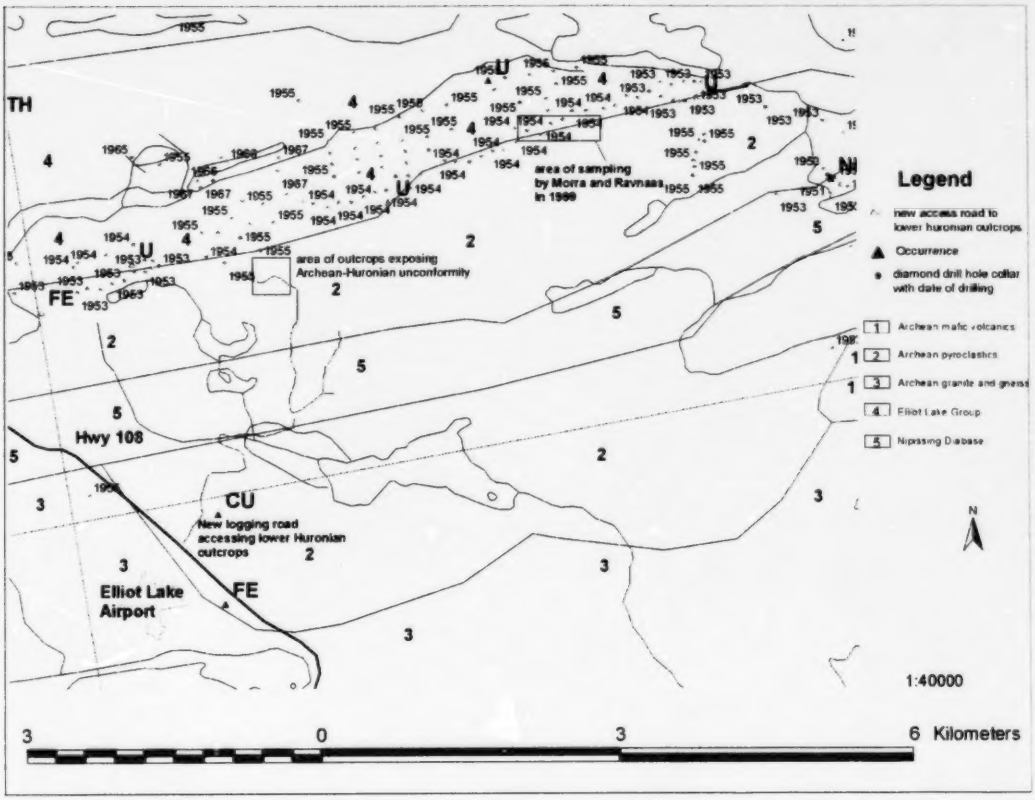

Figure 7. New access road to lower Huronian Outcrops and Livingston Creek Formation.

A map showing outcrop locations and their access is shown in Figure 7. The easterly outcroppings are reached as described above but more westerly outcroppings can be accessed via logging road from the east side of Highway 108, approximately 200m past the Elliot Lake airport road. Paleosols developed in some of these outcrops may provide useful information to researchers regarding the composition of Earth's early atmosphere (Murakami, 1999), and for this reason their location and access have been provided in the accompanying figure.

RECOMMENDATIONS FOR EXPLORATION

Dimension Stone

Felsic intrusive rocks located within and adjacent to the Batchawana greenstone belt were recommended for dimension stone exploration in the Report of Activities last year (Ravnaas, et al., 2000). Accessibility to infrastructure, and most importantly transportation facilities, is fundamental to evaluation of potential dimension stone quarry sites. With this in mind, felsic intrusive outcrops and syenite float boulders were examined in the vicinity of Batchawana Station, where existing infrastructure includes both road and rail access.

A train of dark red syenite boulders trending 060° over approximately 6 km was explored. One outcrop was documented, measuring 5m x 100m and dipping 80° west. The outcrop is not adequately exposed for evaluation, however it is an indication that unexplored building stone potential exists within areas around Batchawana Station. There is no previously recorded work on dimension stone in this area.

The area lies within private land managed by Wagner Ontario Forest Management. Details of licensing procedures and fees may be obtained from Wagner Ontario Forest Management, 71 Black Road, Unit 8, Sault Ste Marie, On. P6A 6J8 (J. Walmsley, Wagner Ontario Forest Management, pers. com., 2000).

A paper copy of the entire road and railroad network in this area is available for viewing at the Sault Ste. Marie District Geologist Office.

Targets for Gold Exploration in the Lower Huronian Sediments

As indicated in Figure 4 and suggested by Tortosa (1984), gold analysis from Elliot Lake sampling in both the Livingstone Creek Formation and the Lorrain Formation have produced disappointing results. Work carried out by Tortosa (1984), discussed earlier in this report, suggests anomalous gold is associated with heavy mineral environments in the Lorrain Formation but the nature of the sediments is distal.

Areas of further work are recommended in the Livingston Creek and Lorraine formations north of Sault Ste. Marie. In Jarvis and Duncan townships, mapping by Bennett, et al. (1975, 1976 and 1979) delineated outcrops of Livingstone Creek Formation in 1 inch to 1/4 mile geological mapping. Outliers of the Lorrain Formation were mapped and described by Born (1987) and Bennett (1975) in Vankoughnet, Tupper and Deroche townships. These sediments are within 40 km of a source area for gold associated with Archean rocks on the south side of the Batchawana greenstone belt. Gold is reported as being hosted within deformed Archean iron formation, quartz knots within pyritic, sericitized metasedimentary rocks and in quartz-carbonate veins in sheared mafic metavolcanic rocks.

An additional area recommended for prospecting Lorrain sediment hosted gold is in Kehoe, Chesley and Chesley Additional townships, northeast of Echo Bay. Outcrops of Lorraine Formation rocks are within 50 km of known Archean gold-bearing source rocks.

Ultramafic Lamprophyre as Targets for diamonds within the Sault Ste. Marie District.

Previous Work:

Sandor Surmacz and Marcelle Hauseux conducted a reconnaissance level prospecting program for diamonds in the Elliot Lake area in 1992. A total of 6 samples of west-trending lamprophyre dikes were collected from the workings of the Stanleigh Mine. Following petrographic and electron microprobe analyses of the samples Surmacz and Hauseux concluded that ultramafic lamprophyres with and without accessory K-feldspar are present in the Stanleigh Mine area, intruded along steeply dipping, deep-seated structures. The authors identified mantle-derived xenoliths of spinel harzburgite and spinel pyroxenite, Cr-diopside and enstatite bronzite from some of the dykes.

Twenty-one basal sediment samples were collected in 1993, down-ice from the ultramafic lamprophyre dikes at the Stanleigh Mine. Analysis of these samples was disappointing with no pyropic garnet grains in any of the samples. Three samples contained ilmenite, with up to 2.58 wt. % Mg0. One sample, located 9 km east-southeast of the Stanleigh Mine, contained ilmenite with up to 1.36 wt. % MgO and chromite with 51.12 wt % Cr_2O_3. One sample was collected from a sand pit where cobble-sized lamprophyre rubble was found between Pardee and Vanhorn lakes in Joubin Township.

A bulk sample of ultramafic lamprophyre was collected from roadside rubble near the Stanleigh Mine and subjected to caustic fusion analysis at the Saskatchewan Research Council in 1995. One twinned, clear microdiamond (0.13mm) was recovered with abundant chromium-bearing, slightly augitic, diopsides and Al-magnesiochromites. Thin sections of xenolithic ultramafic lamprophyre collected from the Stanleigh workings in 1992 displayed Al-magnesiochromite, Fe spinel and Mg-Al titanomagnetite.

Further sampling of rubble near the shaft and within the Stanleigh Mine workings in 1996 produced a second microdiamond (0.14mm) from 19.15 kg. of fused rock, described as a pale yellow, broken dodecahedron with an inclusion. The Saskatchewan Research Council processed the sample. The diamondiferous sample also contained nine Cr-pyrope garnets, one of which was a G-10, and the remainder were classified as G-9 pyrope garnets. Both microdiamonds are believed to have been derived from the Shaft Dike, (so named because it was encountered in the sinking of the number 2 shaft of the Stanleigh Mine), leading the authors to recommend that follow-up exploration for diamonds is warranted in the Elliot Lake area.

Discussion:

The association of diamonds with lamprophyre dikes and in particular those dikes containing deep mantle xenoliths and megacrysts of rounded olivines has been proven successful in locating diamondiferous rock in the Wawa area.

Similar rocks are located in the Sault Ste. Marie district, spatially associated with regional structures bordering and offsetting early Huronian sedimentary rocks. The west-trending Little Moon Lake lamprophyre (not yet visited by the writer) and the lamprophyres described by Hauseux and Surmacz in the vicinity of the Stanleigh Mine are both located on the southern limb of the Quirke Lake syncline. This limb may represent an earlier rift margin structure of the Huronian basin.

The spatial association between lamprophyre occurrences and the north margin of Huronian Supergroup rocks in McMahon and Chesley Additional townships is noteworthy. Additionally, in Salter and Victoria townships near Massey, lamprophyres have been noted cutting rocks proximal to the Murray fault. The Murray fault has also been described as a long lived deep seated structure active as a normal fault during deposition of the Lorrain Formation and a major syn-rift structure. Lamprophyres from the Massey area have been dated at 1430 ±40 million years by Van Schmus (1971).

In Patton Township, 4 km east of Iron Bridge, lamprophyres cutting Nipissing diabase rocks have been dated at 1530 ±50 million years (Van Schmus, 1965).

The location of known lamprophyres and associated early rift-forming structures is indicated in Figure 8. These deep-seated structures may have provided a conduit for deep mantle material to intrude and possibly vent to the paleosurface as diamondiferous diatremes. The structures are recommended as a guide to targeting lamprophyres for diamond exploration in the Sault Ste. Marie District.

A compilation of lamprophyre occurrences has been made in the Sault Ste. Marie District Geologist office and is available for viewing on request.

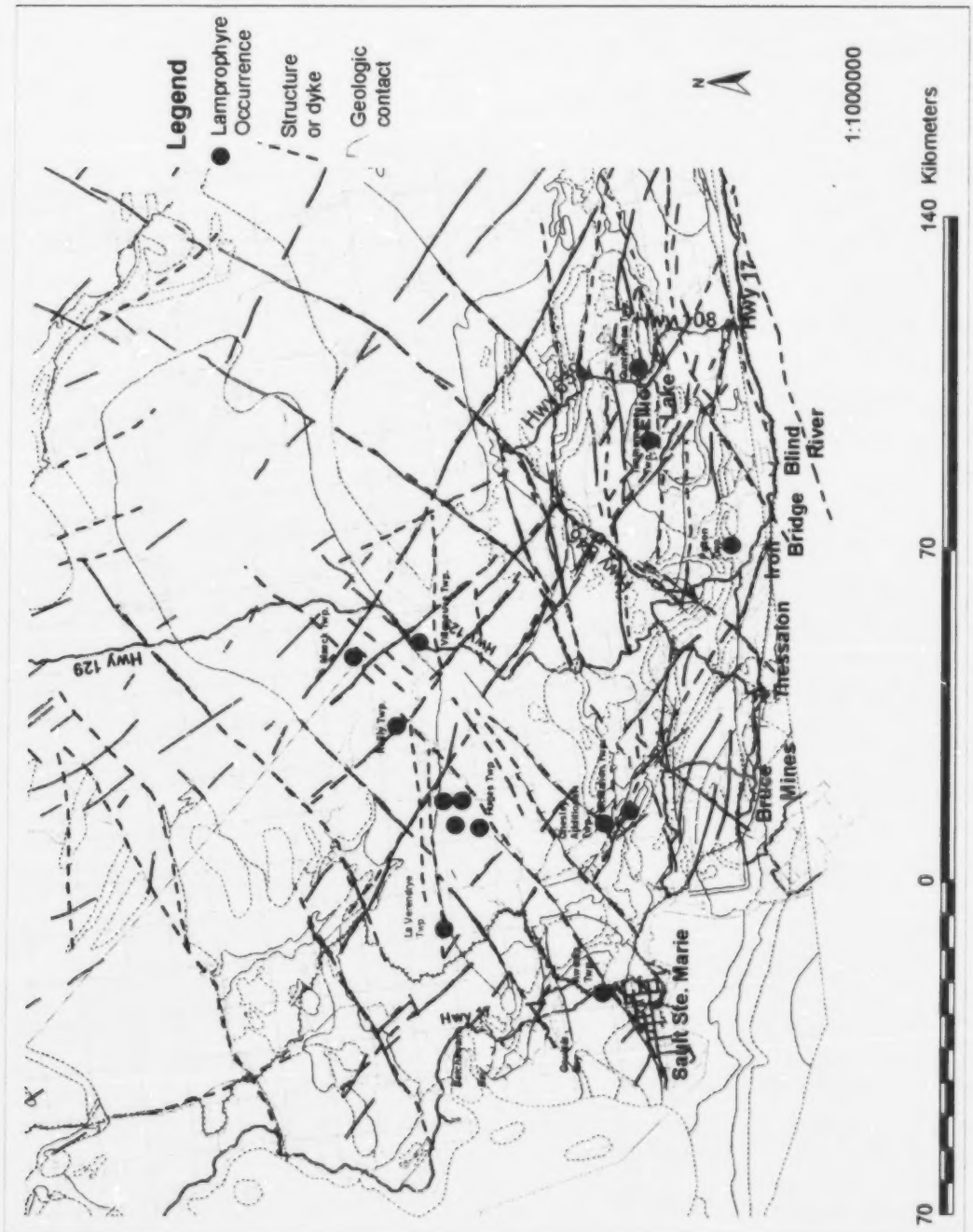

Figure 8. Regional structures and lamprophyre occurrences in the Sault Ste. Marie District.

OGS ACTIVITIES AND RESEARCH BY OTHERS

One Ontario Geological Survey field project was conducted in the Sault Ste. Marie District in 2000: Rowell, D., Sedimentary Geoscience Section, OGS, Aggregate Resources Inventory of the Sault Ste. Marie Area.

Acknowledgements

The District Geologist would like to express his gratitude for the assistance provided by Vivienne Cote on many of the field visits during the course of the summer. In particular the preparation of a self-guided field trip for the Trans Canada trail along the shoreline of Lake Superior through a section of the Keweenawan volcanics between Mica Bay and Mamainse Point. This field trip will be posted on the Resident Geologist's website at http://www.gov.on.ca/MNDM/MINES/resgeol/mmdrgpe.htm

Table 4. Publications received by the Sault Ste. Marie District Office in 2000.

Title	Author	Type and Year of Publication
Summary of Field Work and Other Activities, 2000	Ayer, J.A., Baker, C.L., Kelly, R.I., Parker, J.R., Stott, G.M. and Thurston, P.C., Eds.	OGS OFR 6032, 2000
Report of Activities 1999, Resident Geologist Program, Thunder Bay South Regional Resident Geologist Report: Thunder Bay South District	Schneiders, B.R., Scott, J.F., Smyk, M.C. and O'Brien, M.S.	OGS OFR 6005, 2000
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Table 5. Mineral deposits not being mined in the Sault Ste. Marie District in 2000.

Abbreviations

AF.....Assessment Files
CMH.....Canadian Mines Handbook
GR.....Geological Report
MDC.....Mineral Deposit Circular
MDIR.....Mineral Deposit Inventory Record
MLS.....Mining Lands, Sudbury
MR.....Geological Survey Canada Publication
NM.....The Northern Miner
OFR.....Open File Report
PC.....Personal Communication

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Pater Mine Sprague Twp 41J/2	Cu, Au, Ag	936 670 T @ 1.8% Cu	Rio Algom Limited.	MR 1087	Past Producer 1969-1970
Bar-Fin Mine Thompson Twp 41J/3	Cu	1906 - 130 foot shaft with 250 feet lateral work	Staked	MR 1087	Past Producer 1906
Bald Dome Prospect Plummer Add. Twp 41J/5	Cu	680 388 T @ 0.25% Cu		MR 1087	Inactive
Bruce Mines Plummer Add. Twp 41J/5	Cu, Ag	142 428 T @ 1.% Cu above 155-ft level.		MDC 12	Past Producer 1915-1921
Campbell - Dukes Prospect Plummer Add. Twp 41J/5	Cu	33 000 T @ 1.2% Cu in 230' by 8' by 220' block		MR 223	Past Producer 1956
Rock Lake Mine Aberdeen Twp 41J/5	Cu, Ag	1898-1903: 420 foot shaft with 3 levels and 606 lateral development		MDC 12	Past Producer 1901-1903
Havilah Mine – Ophir Mine Galbraith Twp 41J/5	Au, Ag, Cu	1 main vein, 2 – 150 foot shafts, 1 – 183 foot adit		MDC 12	Past Producer 1892-1922
Steinberg Mine Plummer Add. Twp 41J/5	Cu	47 000 T @ 1.82% Cu or 124 000 T @ 1.1% Cu (drill indicated)		AF	Past Producer 1906 & 1956
Stobie Mine - Rainbow Mine Johnson Twp 41J/5	Cu, Ni, Au	9 T of ore shipped from 1 – 160 foot shaft with 20 feet of lateral workings		MDC 12	Past Producer 1899-1901
Bilton Option Patton Twp 41J/6	Cu	453 593 T @ 1.7% Cu	N/A	MR 1087	Past Producer Pre 1956
Boyea Lake Adit and East Zones	Cu	Adit Area - 128 000 T @1.95% Cu probable & possible to 200 ft.;	N/A.	Sudbury Contact	Past Producer Pre-1942

Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Montgomery Twp 41IJ/6		East Area - 56 500 T @ 2.98% Cu drill indicated to 250 ft.		Mines AR 1971	
Crownbridge (Cannon) Prospect Kamichistiit Twp 41J/6	Cu	415 000 T @ 1.8% Cu diluted grade	N/A.	MDC 12	Past Producer 1966-1967
Glagoma Mine Gladstone Twp 41J/6	Cu	1917 2 shafts sunk to 250 feet		MDC 12	Past Producer 1917 & 1962
Goulding Mine Cobden Twp 41J/6	Cu	1962 816 T @ 1.4% Cu shipped from mine		MDC 12	Past Producer 1962
North Montgomery-Grand Portage Mine Montgomery Twp 41J/6	Cu	147 677 T @ 1.7% Cu – Main Zone 40 9000 T @ 1.96% Cu – No 1 Zone 77 063 T @ 3.23% Cu – No 2 Zone 61 688 T @ 1% cu – West Zone	N/A.	MR 1087	Inactive
Milgate (Abbican) Prospect Nouvel Twp 41J/6	Cu	95 934 T @ 1.08% Cu (drill indicated) A Zone L-600'/ W-10'/ D-235'		MR 1087	Inactive
Principle Strategic Minerals Prospect Gladstone Twp 41J/6	Cu	112 300 T @ 1.54% Cu (drill indicated)		NM MDC 12	Inactive
Sheba Prospect Nouvel Twp 41J/6	Cu	L-1000 ft. by W-3 ft. on surface @ 0.59% Cu	N/A.	MDC 12	N/A
Twin Lakes Prospect Esten Twp 41J/7	Cu	Probable - 76 900 T @ 1.73% Cu over 8.04 ft.	N/A	MDC 12	
Bi-Ore Mine Sagard Twp 41J/10	Cu	13 607 T @ 6% Cu	N/A.	MR 1087	Past Producer 1947-1949
Cheney Mine Gould Twp 41J/11	Cu	39 405 T @ 3.97% Cu (drill indicated)	N/A.	MDC 12	Past Producer 1966-1967
Copper Prince Mine Kamichistiit Twp 41J/11	Cu, Au	45 359 T @ 3% Cu 4 ore shoots near surface		MR 1087	Past Producer 1972
Jardun Mine Jarvis Twp 41K/9	Pb, Zn, Ag, Cu, Au	49 367 T @ 4.4% Pb, 3.1% Zn, 1.42 oz/T Ag	N/A	MDC 12	Past producer 1954-1957
Kerr Scott Deroche Twp 41K/9	Pb, Zn, Ag, Au	1859 T of hand-cobbed ore recovered. Deposit reserves have not been calculated		MDC 12	Past Producer 1939

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Deposit Name/ NTS	Commodity	Tonnage-Grade Estimates and/or Dimensions	Ownership References	Reserve References	Status
Goulais River Vankoughnet Twp 41K/11	Cu, Ag	250 000 T @ 2.35% Cu, 0.26 oz/T Ag in 3 zones (drill-indicated)	N/A	MR 223	Past Producer 1975 & 1981
Kristina Mine LaVerendrye Twp 41K/11	Cu	369 350 T @ 1.95% Cu in No 4 and No. 6 shaft zones	N/A.	MDC 12 MR 223	Past producer 1903-1907
Prace- Sill Lake Mine Vankoughnet Twp 41K/16	Pb, Zn, Ag	340 T Pb, Ag concentrate produced Deposit reserves have not been calculated	N/A.	PC	Past Producer 1981 & 1985-1987
Caputo – Just Wishart Twp 41N/1	Cu	475 T @ 11.18 % Cu recovered from 3 zones		MDC 12	Past Producer 1968
Coppercorp Mine Ryan Twp 41N/2	Cu, Ag, Au	1 360 777 T @ 1.7% Cu in C Zone 362 873 T @ 2.3% Cu in C-2 Zone 589 670 T @ 2.1% Cu in SB Zone 444 520 T @ Cu in Silver Creek Zone	N/A	MR 1087	Past Producer 1964-1972 1 M Tons recovered
Glenrock Palmer Twp 41N/2	Co, Au, Cu	Several zones – main zone L 250 ft. W 3.5ft. (drill indicated)		MR 1087 MDC 12	
Jogran Prospect Ryan Twp 41N/2	Cu, Mo	L-600 ft W- 400 ft D-680 ft @ 0.053% MoS_2, 0.19% Cu (drill indicated)		MDC 12 MR 223	
Mamainse Mine Ryan Twp 41N/2	Cu	Vein L – 1500 ft W – 13 ft 3 shafts sunk to depth 60, 280, 1500 ft.		MDC 12	Past Producer 1882-1884
Maricona Prospect Slater Twp 41N/2	Cu	267 986 T @ 1.17% Cu reserves in 3 sections		MDC 12	
Pancake Lake Kincaid Twp 41N/2	Cu	L 300 ft W-21.5 ft D-200ft @ .76% Cu (drill indicated)		MR 1087	
Tribag Mine Nicolet Twp 41N/2	Cu, W, Ag, Au	2 267 961 T @ 1.6% Cu - Breton Zone 113 397 092 T @ .13% Cu, .27% Mo in East Breccia Zone 429 688 T @ 1.6% Cu – West Breccia 929 864 T @ 2.3% Cu - H Zone 907 184 T @ .2% W in Tailings – H Zone	Channel I	MR 1087 MDC 12	Past Producer 1967 –1973 Production from Breton & West Breccia Zones

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Ontario

Ontario Geological Survey
Regional Resident Geologist Program

Northeast Regional Land Use Geologist District – 2000

by

R. Debicki and G. Yule

2001

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REGIONAL LAND USE GEOLOGIST – NORTHEAST

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INTRODUCTION

Over the past several years, the Government of Ontario has re-engineered the way it delivers services to the people of Ontario. The changes that may be most familiar to the exploration community are the centralization of the Mining Recorders in the province and the posting of claim maps and claims information on the Ministry's website. At the same time, other changes have happened in other ministries throughout government. Some of them have had implications for the Resident Geologist Program.

As a result of these modifications, staff of the Resident Geologist Program have found themselves dealing with new clients in government, agencies, and non-governmental organizations, and delivering services that they had not delivered in past. These new services are important. Many of them relate to land use planning matters that are of interest to, or may directly affect, prospectors and developers. Many of them require knowledge and expertise that are outside the traditional knowledge and experience of professional geoscientists.

Some of these services relate to managing Crown land. They include working with the Ministry of Natural Resources to implement *Ontario's Living Legacy* which involves the establishment of 378 new parks or park expansions and conservation reserves across Ontario, and defining areas of "provincially significant mineral potential" within these new protected areas where mineral exploration will be allowed to proceed. They include administering work permits required for exploration activity in defined environmentally sensitive areas where natural heritage values need special protection, and ensuring that the mineral sector's interests are considered and accommodated in other land use planning initiatives such as forest management plans and the sale and transfer of Crown land.

Other services relate to municipal planning. They include working with Ministry of Municipal Affairs and Housing to review new municipal Official Plans, Official Plan Amendments, and consents (lot severances). Changes made to the *Planning Act* in 1996 recognize the interests of the mineral sector and the importance of protecting areas of high mineral potential from incompatible uses, and require that these considerations be factored into the municipal planning process. These considerations are important in the north where municipalities encompass huge tracts of land, including large areas of base and precious metals potential. They are also important in the south where industrial minerals are essential to the current, rapid expansion of existing communities and to the development of new ones.

In addition, there are emerging requirements for staff of the Resident Geologist Program to help ensure that access to the land base remains open to the exploration community, and to work with First Nations and the mineral sector to develop shared understanding of the other's rights, obligations, and interests in mineral exploration and development on Crown land.

These new and emerging needs were resulting in Resident Geologist Program staff having to divert their energies away from the traditional client services provided to the exploration and development community to attend to land use planning matters. On average, about 20 per cent of staff time was being

directed toward such work – although in Southern Ontario, land use planning consumed as much as 75 per cent of staff time. The end result was less time being available for delivering the level of traditional program services to which mineral industry clients had become accustomed.

To address these converging concerns, three new positions were created and the new "Regional Land Use Geologists" were hired in the autumn of 2000 to alleviate some of the pressures that impacted on the program. These new positions combine geoscience and mineral sector expertise with an understanding of land use legislation, regulations and issues.

Regional Land Use Geologists

Abraham Drost, the Regional Land Use Geologist based in Thunder Bay, is responsible for matters related to land use in the Red Lake, Kenora, Thunder Bay North and Thunder Bay South Resident Geologist districts. He has an M.Sc. degree in geology and a Certificate in Environmental Assessment, and has studied real estate law. Abraham has 16 years' experience in mineral exploration and development and was involved in the discovery of the past-producing Golden Patricia gold mine in northwestern Ontario. He has served on the executive of prospectors' organizations in Thunder Bay and Timmins.

Gord Yule, the Regional Land Use Geologist based in Timmins, is responsible for matters related to land use in the Timmins, Kirkland Lake, and Sault Ste. Marie Resident Geologist districts, plus those portions of the Sudbury Resident Geologist District north of the French River. He has a B.Sc. degree in geology, and 25 years' experience in mineral exploration, during which time he has been involved in the discovery of eight deposits in northeastern Ontario, including five past and present producers.

Dave Rowell, the Regional Land Use Geologist based in Sudbury, is responsible for those portions of the Sudbury Resident Geologist District south of the French River, including Manitoulin Island, plus the Southwestern Ontario and Southeastern Ontario Districts. Dave has an M.Sc. degree in Physical Geography, and 18 years' experience in mapping surficial geology and defining and managing aggregate and industrial mineral resources in the private sector and with the Government of Ontario.

The boundaries of the Regional Land Use Geologist Districts are shown on the map included in the preface to this report.

The result of these appointments, which mark the first significant increase in Resident Geologist Program staff in many years, will be twofold. There will be a reduction of the workload relating to land use issues for other Resident Geologist Program staff, allowing them to concentrate more fully on "traditional" services including:

- maintaining and providing access to assessment files, the drill core library system and other geoscience databases;
- providing information and expert advise on local geology and its mineral endowment;
- conducting client property visits and geology field trips; and
- monitoring exploration activity and generating new recommendations for exploration.

The Regional Land Use Geologists will focus their attention on "emerging" services including:

- providing mineral-related information in support of Crown land planning;

- protecting mineral resources and operations from "sterilization", and people and property from mining and natural hazards during municipal planning; and
- helping explorationists and First Nations understand each other's interests, activities and obligations in mineral exploration and development.

The Resident Geologist Program has created these new staff positions to ensure that knowledgeable service is provided regarding these and other land use issues, since finding solutions to these matters is vital to the health and sustainability of the mineral sector. Liaison with and input from mineral sector representatives, including local prospectors and their associations, will form an essential contribution to the successful delivery of land use planning services that support mineral exploration and development.

REGIONAL LAND USE GEOLOGIST ACTIVITIES

Crown Land Planning

The Ministry of Natural Resources manages Crown land in Ontario through the *Public Lands Act*, the *Parks Act*, the *Aggregate Resources Act*, the *Crown Forest Sustainability Act*, the *Conservation Authorities Act*, the *Oil, Gas and Salt Resources Act*, and other acts. The Ministry of Northern Development and Mines also contributes to Crown land management in the province through the *Mining Act*.

The Regional Land Use Geologists are working closely with Ministry of Natural Resources and their partners in several key areas. They are helping implement the *Ontario's Living Legacy* land use strategy by assisting in the regulation process for the new parks and conservation reserves, and in the development and application of criteria to allow "controlled exploration" in areas within those protected sites where there is provincially significant mineral potential.

They are helping to develop guidelines for the nine "Signature Sites" identified through the *Ontario's Living Legacy* land use strategy; reviewing management plans for both existing and new protected areas; and contributing to other land use planning and policy matters such as the Niagara Escarpment Plan.

The Regional Land Use Geologists are also working to help the mineral exploration and development community understand the forest management planning process, and to know how and when prospectors and developers should participate to ensure that their interests are considered. Forest management plans set the framework for activities in forest units for twenty-year spans, and establish the schedule and locations for access routes during that time. In addition, the Regional Land Use Geologists are working with the Ministry of Natural Resources to establish strategies for allowing the mineral sector to continue to access existing forest access roads.

Development on Private Land

The Ministry of Municipal Affairs and Housing manages planning on private land in Ontario through the *Planning Act*, the *Municipal Act*, and other legislation. Through their one-window approach, MNDM contributes to municipal planning by providing mineral-related technical information regarding private land to municipal governments, provides advice on planning matters that may affect mineral exploration and development, and comments on areas of mineral potential or mining-related hazards.

In conjunction with other program staff, the Regional Land Use Geologists review and comment on draft municipal Official Plans and Official Plan Amendments along with other planning matters including subdivision plans and consents (lot severances) where the approval authority lies with the Province of Ontario. They also provide training sessions and reference materials to representatives of the Ministry of Municipal Affairs and Housing and to municipal planners representing communities across the province. In addition, they may be called upon to serve as "expert witnesses" in cases where planning decisions are being reviewed by the Ontario Municipal Board or other tribunals.

First Nation Interests

First Nation communities across Ontario are looking for new economic opportunities. As well, they are asserting their Aboriginal rights and claiming higher levels of involvement and control concerning economic activity on Crown land within their traditional areas. As a result of a lack of clarity regarding Aboriginal rights on one hand, and some First Nations' lack of familiarity with the "mining sequence" on the other, conflicts have arisen between some explorationists and developers and certain First Nations.

The Regional Land Use Geologists are working with the mineral sector and with representatives of other government ministries and First Nation communities to establish mutual understanding of the actions, implications, and obligations of mineral exploration and development workers, and to facilitate their activities on traditional lands. This work includes sharing information concerning Aboriginal rights and the related obligations of the mineral sector, and discussing the stages of the mining sequence and resulting business opportunities with First Nation community members. The Regional Land Use Geologists are also helping resolve certain land claims in their respective areas.

REGIONAL DISTINCTIONS

It is worthwhile to note that there are significant differences between the critical land-use planning concerns in different parts of Ontario. Northwestern Ontario can be considered the province's "exploration frontier" while northeastern Ontario is an area of more mature exploration and established mining. Southern Ontario is more populated and mineral sector interests are concentrated on a growing industrial mineral and aggregate industry. Each region has its distinct assemblage of planning-related issues.

Northwestern Ontario, the province's "exploration frontier", is characterized by large tracts of open Crown land. Forest management and logging activities are regionally important and First Nation communities throughout the region are expressing their interest in Aboriginal rights. The area has limited infrastructure and access to remote areas, and is considered under-represented in terms of protected areas.

Northeastern Ontario has a high density of mining land tenure and numerous producing and past-producing mines. Forest management and logging activities are also regionally important and there are local to widespread Aboriginal issues. The area is also considered to be under-represented in terms of protected areas, but has more urbanization, infrastructure and private land holdings than northwestern Ontario, making it more difficult to identify unencumbered lands that may be set aside to protect and preserve natural heritage values.

Southern Ontario is an area with much higher population density and a relatively small amount of Crown land, and a greater focus on a growing industrial mineral and aggregate industry. There is major

urbanization and well-developed infrastructure, however the high population density leads to greater opposition to many mineral-related activities and developments.

NORTHEASTERN ONTARIO ACTIVITIES

Introduction

There are at least 12 major provincial legislative acts, with accompanying regulations, guidelines and policies developed by several provincial ministries that relate to land use in Ontario. Some apply to Crown land while others apply to private land. The Regional Land Use Geologist combines geoscientific, mineral exploration and development expertise with an understanding of provincial legislation, regulations, policies and land use issues in order to optimize Ontario's land base for sustainable, safe and environmentally responsible mineral resource development.

The Northeast Regional Land Use Geologist coordinates this mandate with other provincial ministries, municipalities, land-use interest groups and First Nations in the northeast to address matters including implementing the *Ontario's Living Legacy* land use strategy, preparing forest management plans, and monitoring development on private land.

Ontario's Living Legacy Land Use Strategy

The *Ontario's Living Legacy* (OLL) land use strategy is the province's Crown land management initiative to provide representative protected areas within a defined expanse of the province referred to as the "area of the undertaking" (i.e. principally all of the shield area south of latitude 51 degrees). Another principal tenet of the OLL land use strategy is to strengthen the economic health of the area.

The *Ontario's Living Legacy* land use strategy identified a total of 378 new provincial parks or parks expansions and conservation reserves within the area of the undertaking, of which 136 occur within the northeast region and have been reviewed by the Northeast Regional Land Use Geologist. Of these 136 sites, the Ministry of Natural Resources is preparing 38 for regulation in the spring of 2001. The Regional Land Use Geologist worked with other Resident Geologist Program staff to help identify and minimize mining land tenure conflicts in the new protected areas. During preparation of the identified sites for regulation, the Regional Land Use Geologist also discussed access to mining interests within the sites, water crossings in waterway parks, and the definition and location of park boundaries.

The *Ontario's Living Legacy* land use strategy allows for controlled mineral exploration in specified areas within new parks and conservation reserves identified as having "provincially significant mineral potential" (PSMP). If a mineral discovery is made in such an area and the site develops into an advanced exploration project or a new mine, the area of the discovery or proposed disturbance will be de-regulated and an appropriate, alternative area of equal size and natural heritage value will be regulated as protected area. Upon site rehabilitation at the completion of the exploration/mining activity the deregulated land will be returned to park status.

The Regional Land Use Geologists have contributed to a committee of industry and government representatives assembled to define the criteria for "provincially significant mineral potential" and a process for ranking the potential of areas of interest. At the time of writing, the process for defining PSMP is currently close to completion. It is envisioned that this mineral potential evaluation process will

be incorporated into future land use planning activities and initiatives for both Crown and private lands in the province.

Forest Management Plans

There are 63 Sustainable Forest License (SFL) areas throughout the province. Each SFL area requires a Forest Management Plan to guide all harvesting activities within the subject Crown forests. Forestry operations include forest access road construction, maintenance and abandonment; stream crossings; timber harvesting and silvicultural practices. The plan must have regard for all other resource values as well as social (cultural, heritage, and tourism) and ecological (fish, wildlife, environmental) values.

In the northeast region, nine Forest Management Plans are currently being prepared for approval in 2001. During the past year, eight such plans were developed for approval and implementation. In conjunction with colleagues, the Northeast Regional Land Use Geologist is working to promote mineral resource values to Forest Management Plan authors and to highlight the opportunities available to the mining community through the Forest Management Plan development process.

Other Activities on Crown Land

The concept of "controlled exploration" has been proposed as an option in several situations to ensure that claim staking and mineral exploration activities are allowed to continue within protected, environmentally sensitive areas. To date, the concept has been applied to five areas within the Temagami area in accordance with the Temagami Land Use Plan. Work permits are required for some exploration and development activities within these areas, subject to regulations defined under the *Public Lands Act* - Reg.349/98, and in the *Mining Act* - Reg.356/98, s.1. Work permits are not required for similar activities in other areas. One application for a work permit for proposed work within the Temagami Skyline Reserve was reviewed and granted, subject to conditions under which the work may be performed.

Development on Private Land

Development on private land is largely subject to the control of the Ministry of Municipal Affairs and Housing (MMAH). The Northeast Regional Land Use Geologist works closely with MMAH to ensure that the clauses in the Provincial Policy Statement of the *Planning Act* relating to mineral resources, mineral extraction, and mining-related hazards are given due consideration when planning decisions are made.

In the northeast, the Regional Land Use Geologist reviewed 19 draft Official Plans and two Official Plan amendments for various municipalities. In addition, ten consents (lot severances) and five development projects were reviewed during the year. The Northeast Regional Land Use Geologist is also assisting MMAH in their review of the effectiveness of the five-year-old Provincial Policy Statements to ensure that municipalities are making better planning decisions.

First Nation Interests

On an ongoing basis, Ministry of Northern Development and Mines staff, including the Northeast Regional Land Use Geologist, are meeting with First Nation communities who are interested in developing knowledge about the mining sequence, exploration and mining activities, and the impacts and benefits that may flow from such activities. Of the 37 First Nation communities located in the northeast, the communities of Peawanuk (Winisk), New Post, Wahgoshig, and Temagami First Nations have been contacted to date and provided with background information. The meetings aim to promote dialogue and understanding between First Nation communities and the minerals industry, as well as to help First Nation communities make informed decisions concerning potential mineral resource development on traditional lands and to recognize economic development opportunities.

The Regional Land Use Geologist is also working with several MNDM colleagues and representatives of other provincial ministries to help reach a settlement with the Temagami First Nation and the Teme-Augama Anishnabai concerning their land claim. A "Framework Agreement" signed June 21, 2000 provides for a thirty-month process to guide the parties in negotiating a settlement to this long-standing issue. The Resident Geologist Program is providing technical support to the Ontario negotiating team through contributions from the Northeast Regional Land Use Geologist and the staff of the Kirkland Lake Resident Geologist office. Ministry staff are also involved in three Joint Working Committees comprised of staff from various Ontario ministries and representatives from the Aboriginal community and local municipality. Through monthly meetings and periodic information briefings, the Joint Working Committees are developing and sharing information about lands, economic development, and land-use and resource management to support the main negotiating table.

The Lands Committee is considering such matters as potential locations for a mainland community site and traditional family land sites; reviewing compatible uses of these lands; and potential forms of land tenure and their ramifications.

The Land Use and Resource Management Committee is developing an information base on land use and resource management processes between the Aboriginal community and other parties. This committee is working to identify traditional and compatible land uses to minimize and mitigate adverse impacts on environmental and cultural concerns of neighbouring land users.

The Economic Development Committee is identifying how proposed settlement funds can best be used to enhance Aboriginal self-reliance through economic development and to promote the local economic base for all stakeholders and the Aboriginal community as defined in Ontario's Aboriginal Policy Framework.

These committees support the process identified in the "Framework Agreement", wherein there will be an information gathering phase lasting 12 months; an issue identification and option development phase lasting six months; and a consensus building phase lasting 12 months which culminates in a final settlement.

Metric Conversion Table

Conversion from SI to Imperial			Conversion from Imperial to SI		
SI Unit	*Multiplied by*	*Gives*	*Imperial Unit*	*Multiplied by*	*Gives*
		LENGTH			
1 mm	0.039 37	inches	1 inch	**25.4**	mm
1 cm	0.393 70	inches	1 inch	**2.54**	cm
1 m	3.280 84	feet	1 foot	**0.304 8**	m
1 m	0.049 709	chains	1 chain	20.116 8	m
1 km	0.621 371	miles (statute)	1 mile (statute)	**1.609 344**	km
		AREA			
1 cm^2	0.155 0	square inches	1 square inch	**6.451 6**	cm^2
1 m^2	10.763 9	square feet	1 square foot	**0.092 903 04**	m^2
1 km^2	0.386 10	square miles	1 square mile	2.589 988	km^2
1 ha	2.471 054	acres	1 acre	0.404 685 6	ha
		VOLUME			
1 cm^3	0.061 023	cubic inches	1 cubic inch	**16.387 064**	cm^3
1 m^3	35.314 7	cubic feet	1 cubic foot	0.028 316 85	m^3
1 m^3	1.307 951	cubic yards	1 cubic yard	0.764 554 86	m^3
		CAPACITY			
1 L	1.759 755	pints	1 pint	0.568 261	L
1 L	0.879 877	quarts	1 quart	1.136 522	L
1 L	0.219 969	gallons	1 gallon	**4.546 090**	L
		MASS			
1 g	0.035 273 962	ounces (avdp)	1 ounce (avdp)	28.349 523	g
1 g	0.032 150 747	ounces (troy)	1 ounce (troy)	**31.103 476 8**	g
1 kg	2.204 622 6	pounds (avdp)	1 pound (avdp)	**0.453 592 37**	kg
1 kg	0.001 102 3	tons (short)	1 ton (short)	**907.184 74**	kg
1 t	1.102 311 3	tons (short)	1 ton (short)	**0.907 184 74**	t
1 kg	0.000 984 21	tons (long)	1 ton (long)	**1016.046 908 8**	kg
1 t	0.984 206 5	tons (long)	1 ton (long)	**1.016 046 90**	t
		CONCENTRATION			
1 g/t	0.029 166 6	ounce (troy)/ ton (short)	1 ounce (troy)/ ton (short)	34.285 714 2	g/t
1 g/t	0.583 333 33	pennyweights/ ton (short)	1 pennyweight/ ton (short)	1.714 285 7	g/t

OTHER USEFUL CONVERSION FACTORS

	Multiplied by	
1 ounce (troy) per ton (short)	31.103 477	grams per ton (short)
1 gram per ton (short)	0.032 151	ounces (troy) per ton (short)
1 ounce (troy) per ton (short)	20.0	pennyweights per ton (short)
1 pennyweight per ton (short)	0.05	ounces (troy) per ton (short)

Note: Conversion factors which are in bold type are exact. The conversion factors have been taken from or have been derived from factors given in the Metric Practice Guide for the Canadian Mining and Metallurgical Industries, published by the Mining Association of Canada in co-operation with the Coal Association of Canada.